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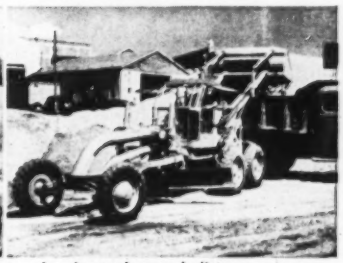

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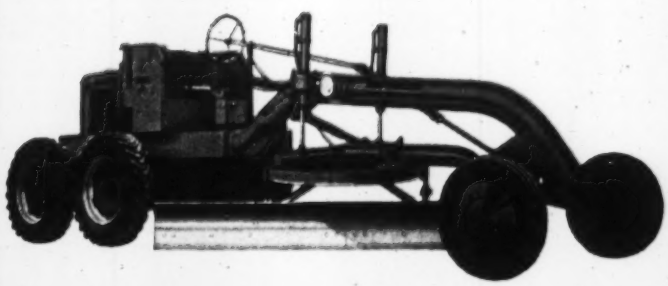

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Robert F. Boger
Publisher

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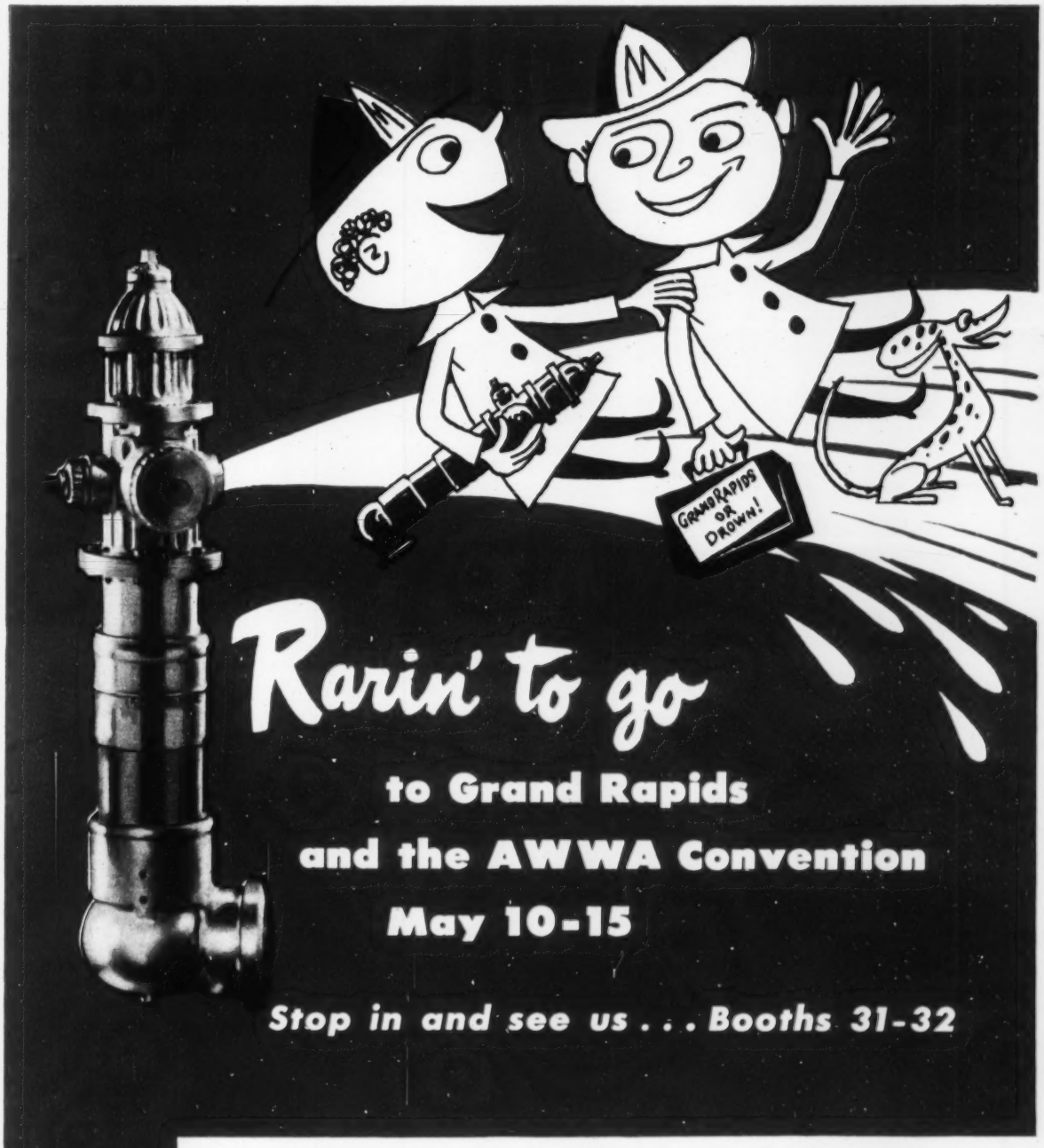

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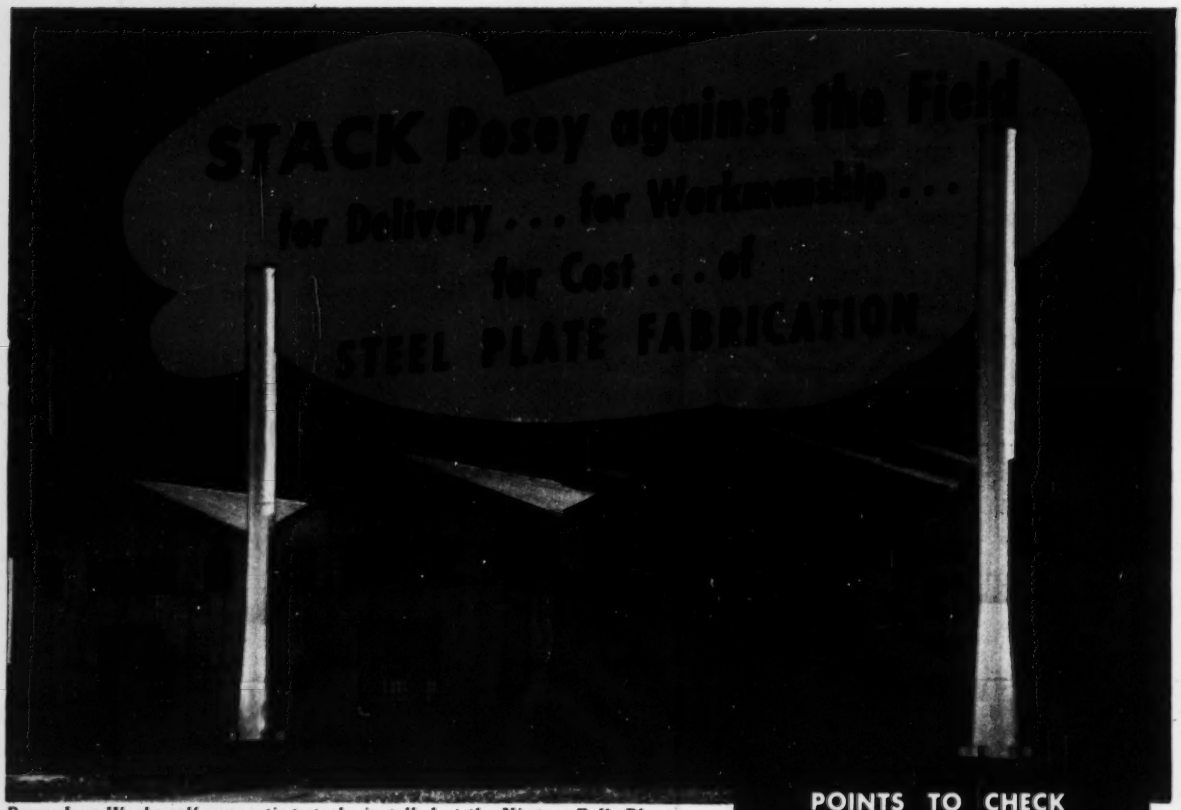

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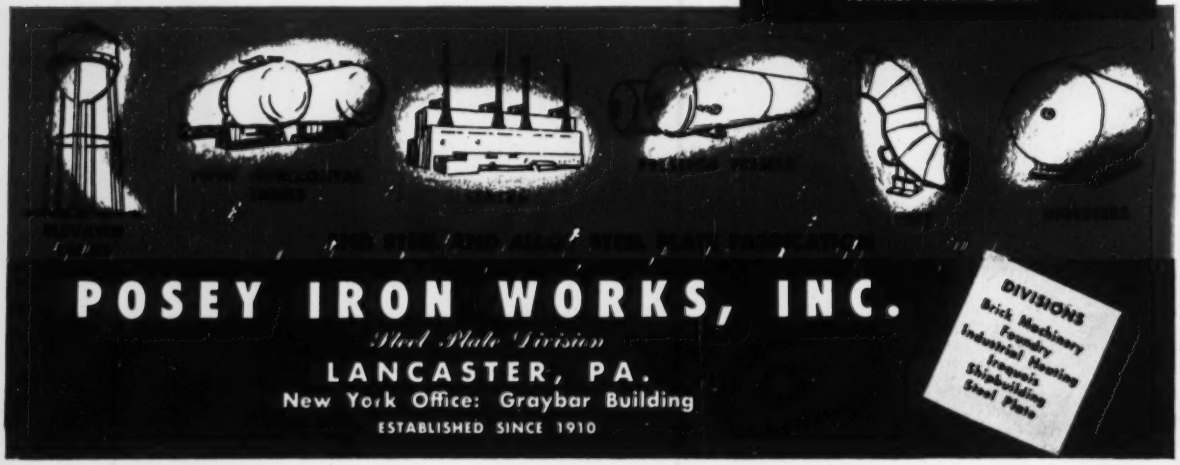

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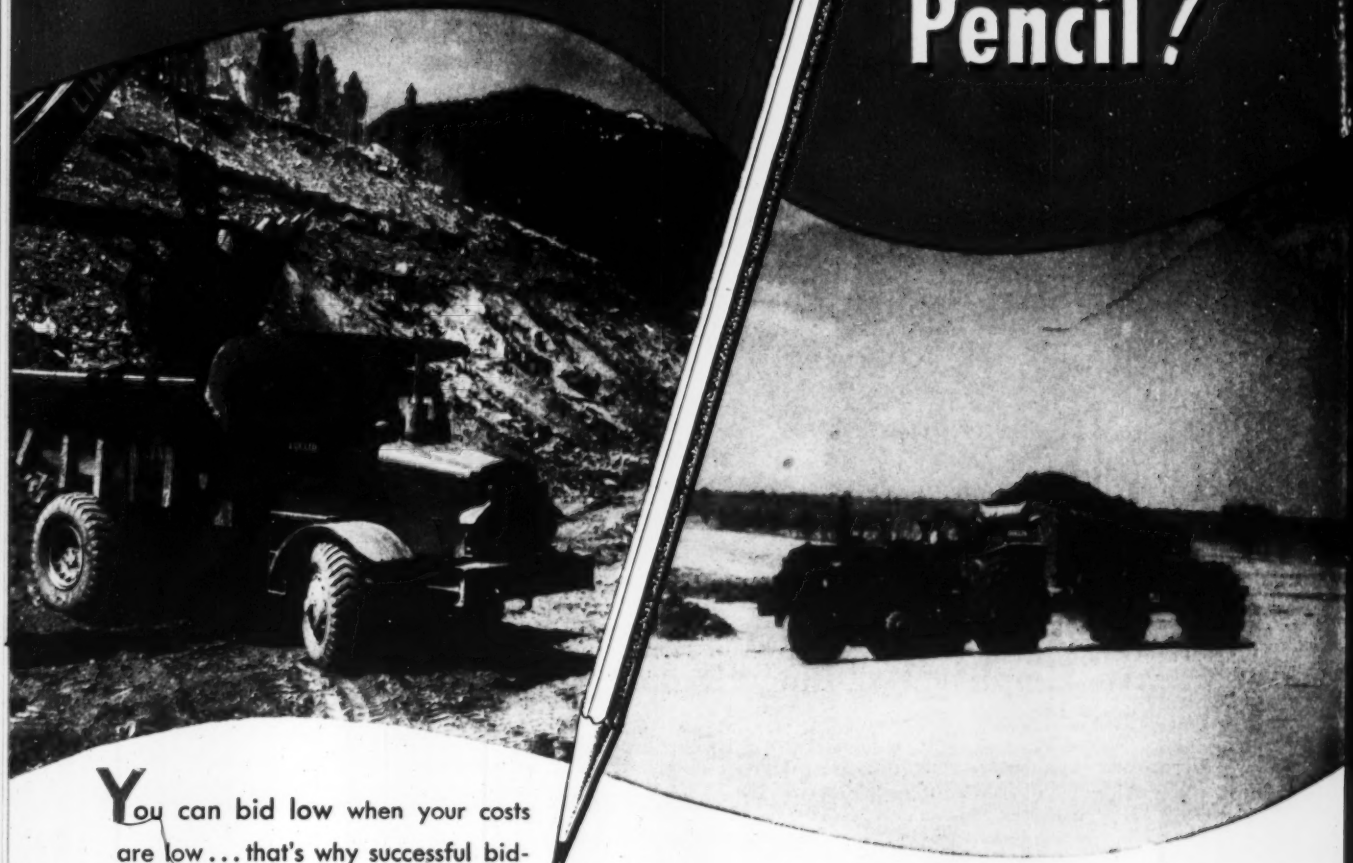

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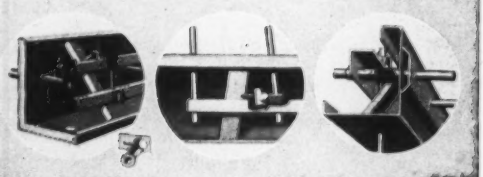

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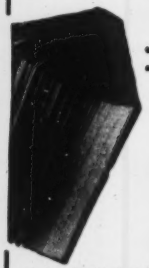

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READER COMMENT

German construction

Sir: I was very much interested in the article "German Construction—American View" (ENR Sept. 25, 1952, p. 58). Unfortunately I have to admit that quite a few of Colonel Snetzer's remarks are justified. Some of the reasons for these shortcomings, as mentioned in the article, were the heavy losses of building equipment during the war, the lack of capital to buy new machinery, the high rate of interest, low wages, etc. Furthermore, one must take into consideration that the German building equipment industry was not able or allowed to produce modern and efficient machinery for some years after the war.

Nevertheless, the German building trade has built quite a few projects for the U. S. Occupation Forces where the criticism voiced in the article fails to apply, or if it does, then only to a very limited degree. On a number of these jobs, things differed considerably from those described by Colonel Snetzer as far as cooperation with the subcontractors for all kinds of installation and the use of modern equipment are concerned.

I also should like to direct your attention to the problem of bidding procedure. It is stated that after the opening of the bids other firms hand in bids which are considerably lower. It is further stressed that well-known big companies quite often are underbid by less-known smaller companies which are fully qualified for the specified work. It seems to me that the general objection to German building methods may be based upon the experience with just such contractors whose companies often sprang up immediately after the war. Unfortunately the report does not mention the high number of bankruptcies among such companies. It is a fact that 38% of all bankruptcies since the currency reform have been in the building trade.

Even though the German industry, judging from all available reports, has not yet reached the high stage of mechanization that the United States industry enjoys, I am sure that German contractors carry out their work on large jobs with the proper amount of heavy and light equipment in order that the time limit set may be met, the required quality of work attained, and a high degree of productivity reached. Incidentally, it is controversial if the same high degree of mechanization can be reached in Germany due to general conditions, and also if such a development is desirable in view of the large number of refugees and unemployed.

H. W. Puell
Munich, Germany

More on shortage

Sir: I was delighted to see you publish at least a small counter to the great blast of propaganda currently being directed at high school students re the fabulous salaries awaiting engineering college graduates. (ENR Apr. 2, 1953).

I vividly recall the reprimand I received from the head of a consulting firm in 1949 for refusing to accept a position (?) paying $1.25 per hour. I had just received a B.S. in Civil Engineering from the U. of California.

Any high school student contemplating an engineering career would do well to study "The Engineering Profession In Transition," a report published by the Engineers Joint Council. (33 W. 39th St., N. Y.)

Robert Skimin
Vista, Calif.

Lowered supports not needed

Sir: The article "Built-in deflections cut frame cost," by R. W. Waterhouse (ENR March 26, p. 45) refers to a structure in which the author has improved the relative magnitudes of the moments of three-span beams by lowering the two inner supports a predetermined amount with respect to the line connecting the outer supports. In this manner the maximum moment was reduced from 0.1 WL to 0.085 WL, resulting in a saving of about 15% in weight of beams.

A slightly larger saving could have been achieved without reverting to built-in deflections, if use had been made of a provision in Section 15, a, 3 of the American Institute of Steel Construction Specification, which was first introduced in 1946. It reads, abbreviated, "Fully continuous beams may be proportioned for negative moments at interior supports at a unit stress 20% higher than above stated, provided that the section modulus over supports shall not be less than that required for maximum positive moments."

Hence, if the basic unit stress for this design was 20,000 psi, then 24,000 psi could have been used for interior support moments. This amounts to the same as using 20,000 psi throughout, but reducing the sup-

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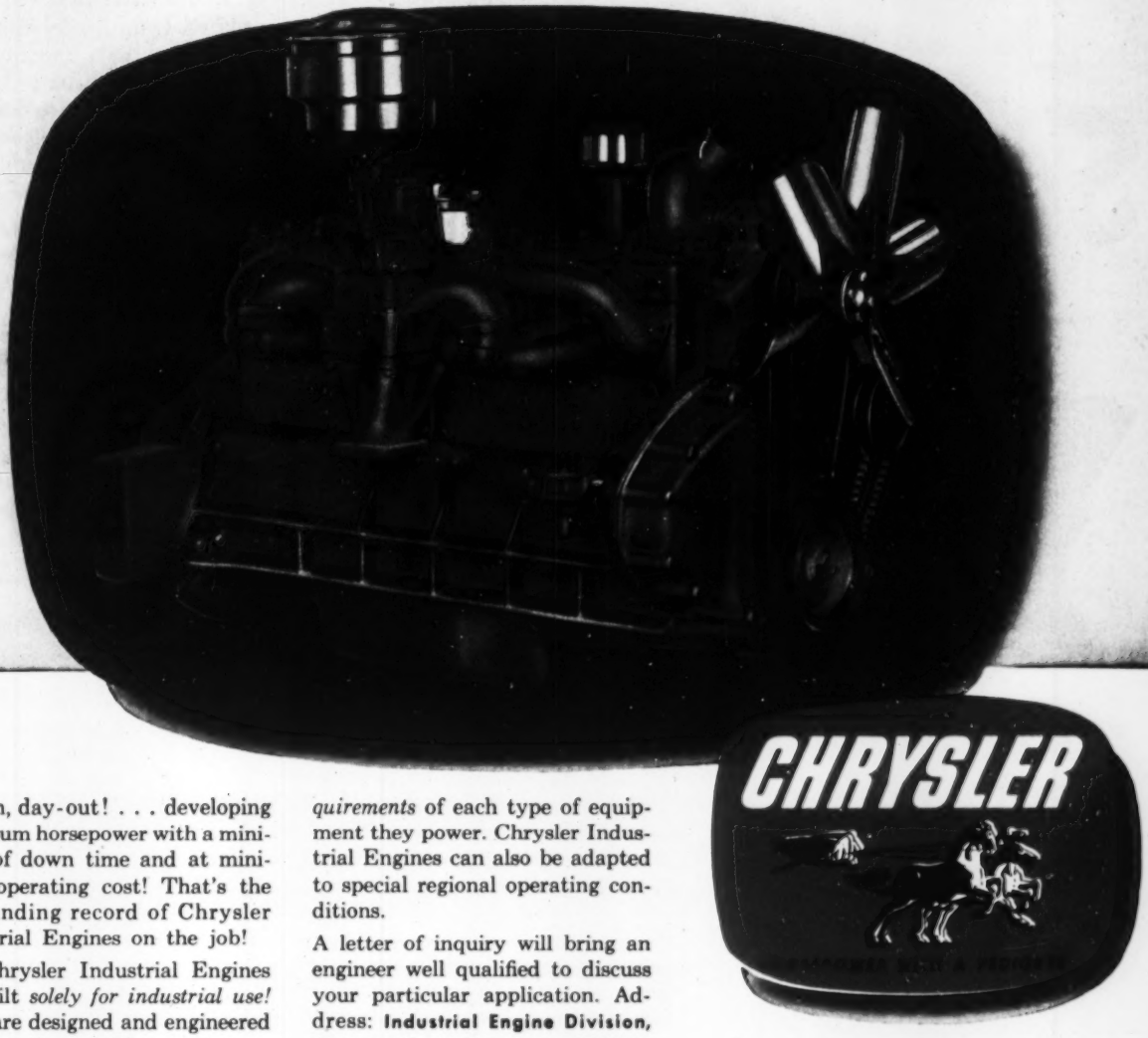

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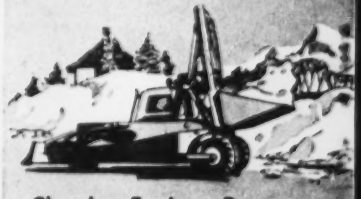

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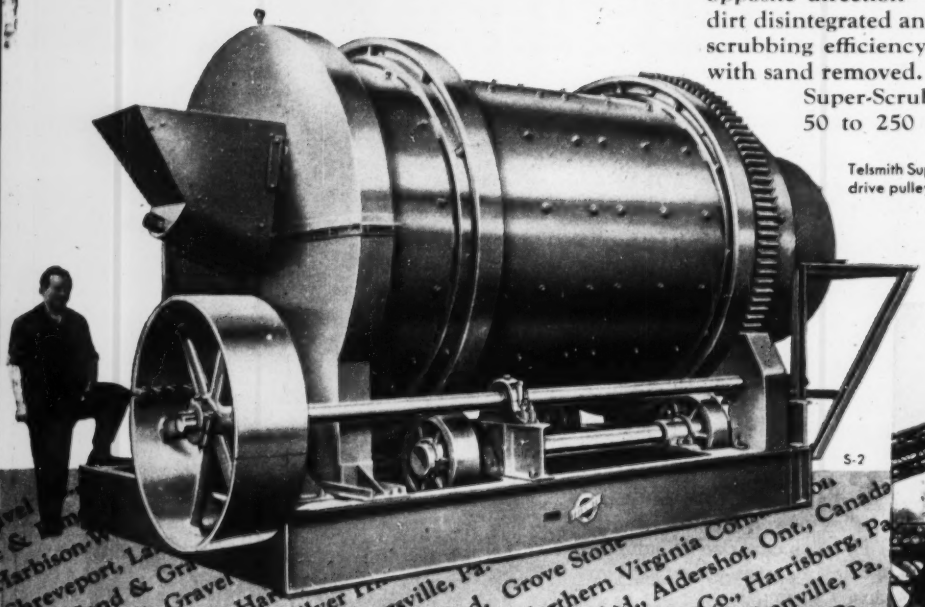

Telsmith Super-Scrubber complete on steel frame with flat belt drive pulley. Can be furnished with enclosed, silent-chain drive.

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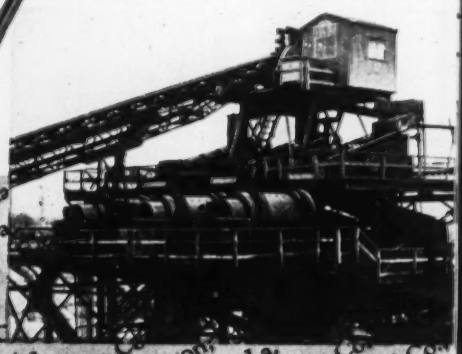

S-2

Shreveport, La.
Amico Sand & Gra
George Sand & Gravel
Pennsylvania Supply Co., Har
Silverhill Sand & Gravel Co., Silver H
Lycoming Silica Sand Co., Montoursville, Pa.
May Sand & Gravel Corp., Fort Wayne, Ind.
District Sand & Gravel Co., Washington, D. C.
Buffalo Sand & Gravel Co., Silver Hill, Md.
Valley Mould & Iron Co., Cleveland, Ohio
Amico Sand & Gravel Co., Morrisville, Pa.
Fenton Construction Co., Ashland, Ohio
Colonial Sand & Stone Co., Inc., Port Washington, N. Y.
Grove Stone & Sand Co., Swannonoa, N. Carolina
New Enterprise Stone & Lime Co., New Enterprise, Pa.
Northern Virginia Construction Co., Alexandria, Va.
Rogers Construction Co., Portland, Ore.
Contee Sand & Gravel Co., Fairland, Md.
Dutchess Quarry & Supply Co., Poughkeepsie, N. Y.
Prince George Sand & Gravel Co., Laurel, Md.
Kilbuck Sand & Gravel Co., Laurel, Md.
Harbison-Walker Refractories, Brinkhaven, Ohio
Silverhill Sand & Gravel Co., Silver Hill, Md.
Davis Sand & Gravel Co., Clinton, Md.
Sharon Silica Co., Jackson, Ohio
Killbuck Sand & Gravel Co., Millersburg, Ohio
J. Cooke, Ltd., Aldershot, Ont., Canada
Pennsylvania Supply Co., Harrisburg, Pa.
Fiala Crushed Stone Corp., Annville, Pa.
Banks Stone & Sand Co., Kingston, Pa.
Drake-Winkelman, Cuba
Fenton Construction Co.
Rogers Construction Co.
Sharon Silica Co., Jackson, La.
Meriwether Supply Co., Shreveport, La.
Sheffield Steel Co., Linden, Texas
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READER COMMENT

port moments in the ratio 1 : 1.2, which results in negative moments of 0.0833 *WL*, as compared with 0.085 *WL* as used by the author. It is seen that this provision would have permitted a somewhat greater saving without the necessity of providing different levels for the supports.

The justification for the above AISC provision lies in what is known as plastic or limit design and was explained in some detail by T. R. Higgins, director of engineering, AISC, in his article, "Steel Building Code Changed Analyzed," (ENR Oct. 17, 1946, vol p. 529).

Incidentally, Mr. Waterhouse's example illustrated the fact that in many cases unequal support settlements in continuous steel structures are by no means as detrimental to strength (as distinct from appearance, etc.) as would be indicated by elastic analysis. This can be demonstrated by the theory of plastic or limit design which is amply supported by tests within certain restrictive limitations.

GEORGE WINTER
Professor and Head of
Structural Engineering Dept.
Cornell University
Ithaca, N. Y.

CALENDAR

American Water Works Association, annual meeting, Municipal Auditorium, Grand Rapids, Mich., May 10-15.

Rail Steel Bar Association, annual meeting, Greenbriar Hotel, White Sulphur Springs, W. Va., May 11-13.

Conference on instrumentation in water, sewage and industrial waste treatment, Manhattan College, N. Y. City, May 14.

Annual Northwest Traffic Engineering Conference and Western section of Institute of Traffic Engineers, More Hall, University of Washington, Seattle, May 21-22.

Society of Fire Protection Engineers, Palmer House, Chicago, May 21.

Society for Experimental Stress Analysis, Hotel Schroeder, Milwaukee, Wis., May 20-22.

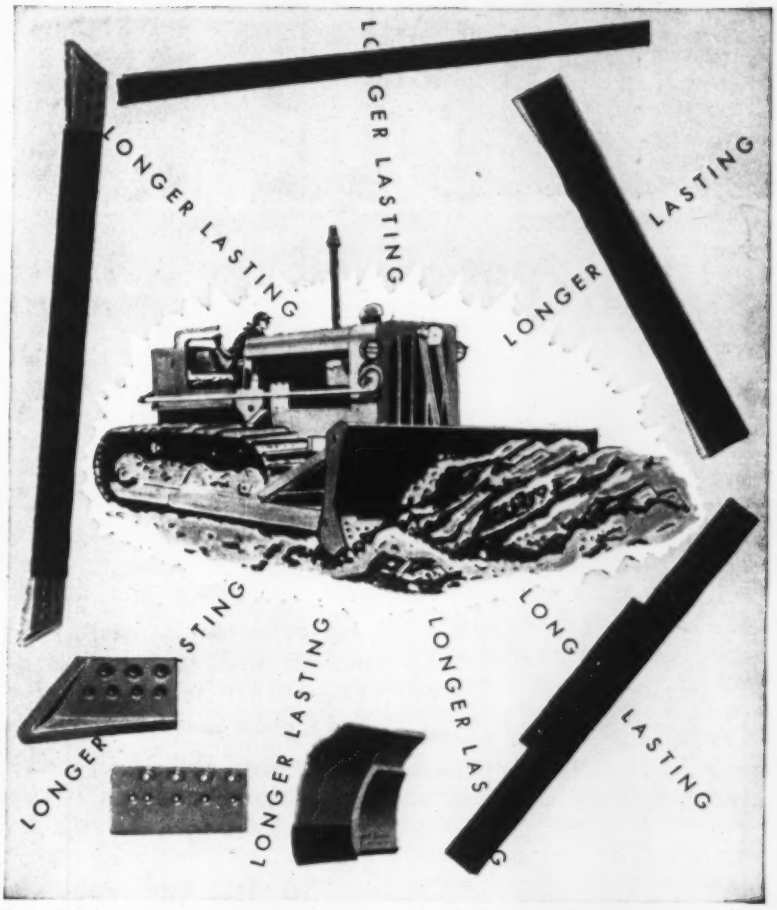
American Society of Civil Engineers, spring meeting, Casablanca Hotel, Miami Beach, Fla., June 15-19.

National Society of Professional Engineers, Sheraton Beach Hotel, Daytona Beach, Fla., June 18-20.

American Society for Engineering Education, annual meeting, University of Florida, Gainesville, June 22-26.

Conference on modern highways, Massachusetts Institute of Technology, Cambridge, Mass., June 23-25.

Summer program in Advanced Strength of Materials, M.I.T., Cambridge, Mass., July 6-17.



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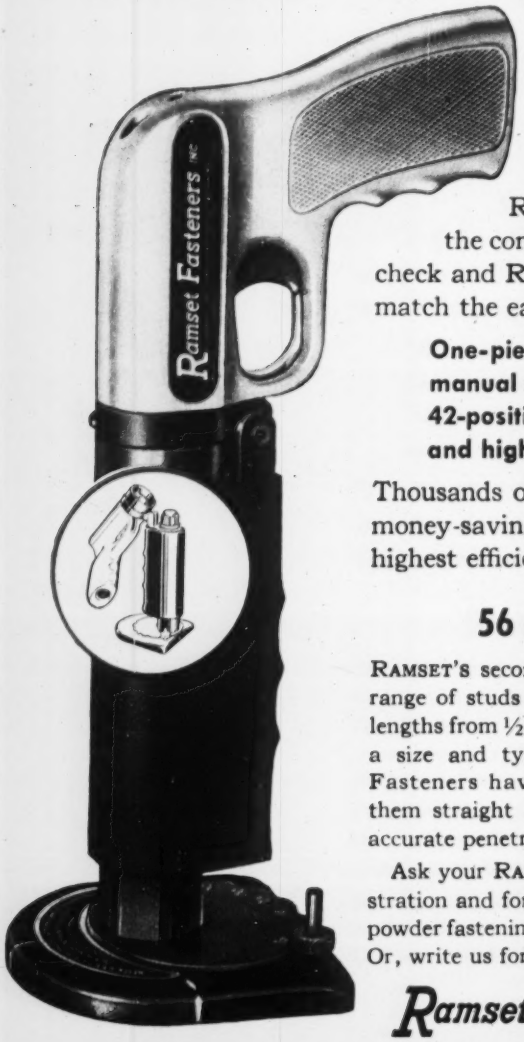

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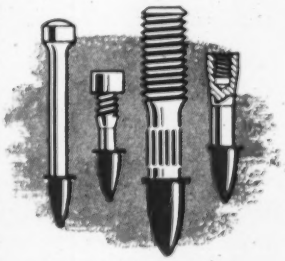

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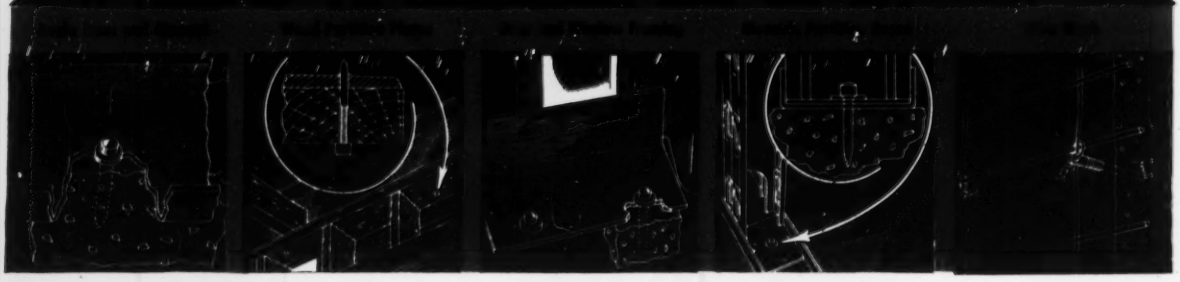
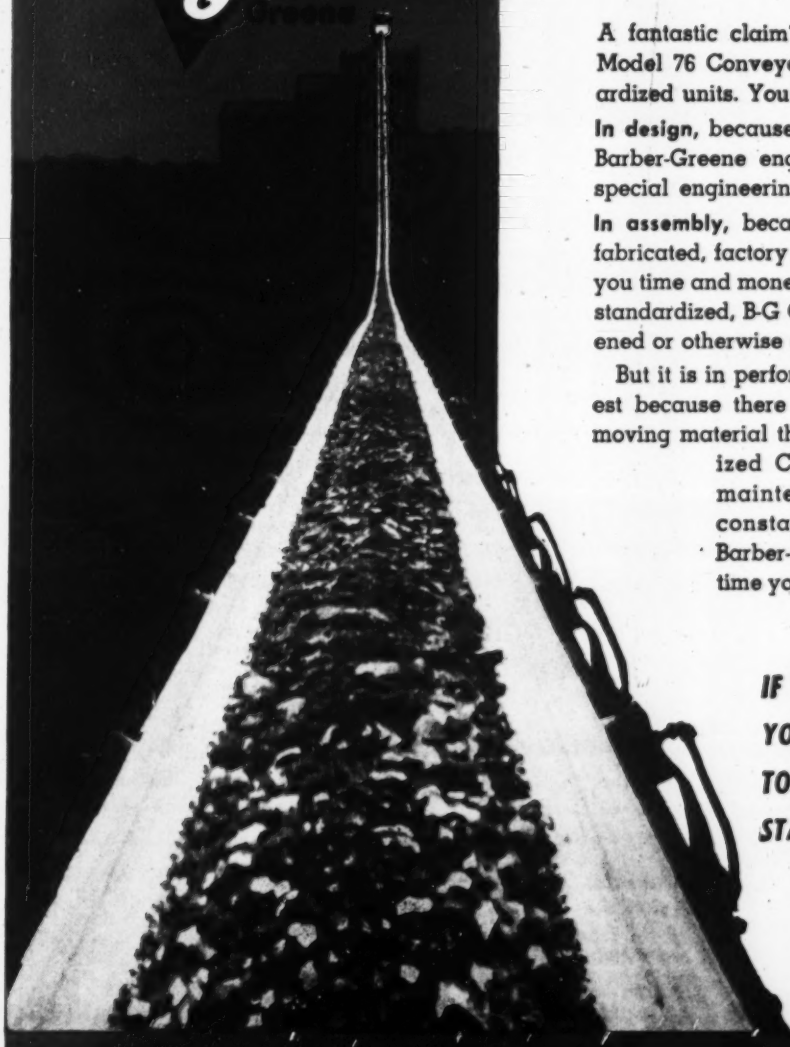


THIS BARBER-GREENE CONVEYOR

BEGAN SAVING MONEY

BEFORE IT WENT TO WORK



A fantastic claim? Not at all. Every Barber-Greene Model 76 Conveyor consists of pre-engineered, standardized units. You save in these important ways:

In design, because all this has already been done by Barber-Greene engineers—you don't need expensive, special engineering.

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But it is in performance that your savings are greatest because there is no more economical method of moving material than with a Barber-Greene Standardized Conveyor. Power costs are low—maintenance is minimum—production is constant. Why not take advantage of Barber-Greene's broad experience the next time you have a material handling problem.

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JOY K-81, a rugged tool capable of sustained operation on the heaviest demolition work.

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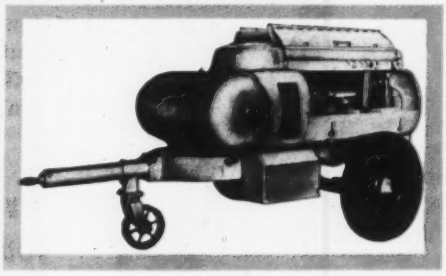
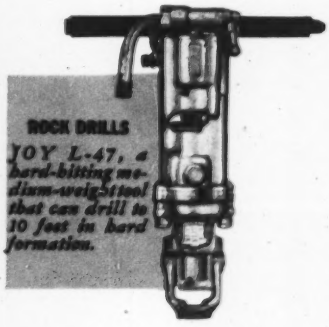
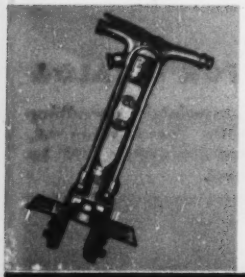




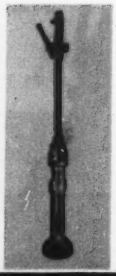
ROCK DRILLS

JOY L-47, a hard-hitting medium-weight tool that can drill to 10 feet in hard formation.



SHEETING DRIVERS

JOY Q-81, an adaptation of the K-81 for driving wood or light steel sheeting.



BACKFILL TAMPERS

JOY C-35, an easy tool to handle, yet delivers powerful blows for faster tamping.

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JOY M-2, a light tool for digging in clay, shale, hardpan, or hard-frozen ground.

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- **New market?**—The seeds of new construction—of thermal power plants—in areas hitherto impracticable because of transport difficulties—may be contained in a process which is noted by the U. S. Bureau of Mines in a recent report.

  The process, which will be used by the Texas Power and Light Co. to fuel its generating station in Milam County, Tex., next year, converts lignite and other low-grade western coal into boiler fuel. Known as coal carbonization in a fluidized state, the process represents two years of experimenting. It is a variation of low-temperature carbonization and yields a char of high heating value for power plant use. (If you're interested, the process is described in "Report of Investigations 4954, Bureau of Mines, 4800 Forbes St., Pittsburgh, 13, Pa.)

- **Narrow fields for engineers**—The question of whether professional engineers must limit their work to the branch of engineering in which they are trained and registered is now before the British Columbia Court of Appeals.

  Case in point is an appeal by a chemical engineer against a judgment of the B.C. supreme court. The lower court had thrown out the chemical engineer's claim for payment of fees from an architect, on the ground that the chemical man had practiced in other than chemical fields (he claimed to have aided in structural work—including a concrete arena in Victoria, and in laying out an electrical system).

  Until the B.C. court's ruling, it was considered a legitimate practice in the province for professional engineers to work in any branch in which they felt themselves qualified—without regard to certification.

- **Housing cleared**—Oregon's legislature cleared the way for public housing work outside incorporated municipalities—and thus for many defense projects. Previously, state law governing housing authorities prohibited such organizations outside incorporated areas. New laws remove the restriction.

  Particular target: housing for workers on The Dalles Dam, the Columbia River Toll Bridge, and Harvey Aluminum Co.'s big plant in Wasco County.

- **Bridges ordered**—Still awaiting the outcome of the concrete vs. asphalt controversy, Ohio's Turnpike Commission was permitting no delay to stall its plans for the 240-mi toll road.

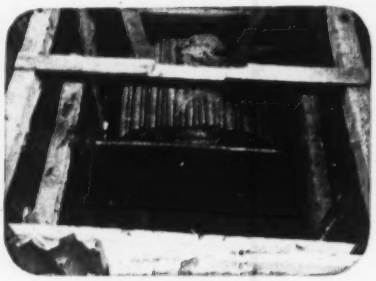
  It advertised for bids for fabrication and delivery of 9,068 tons of steel, to be used on bridges for the eastern-most 45 mi of the road.

  Bids will be opened May 8.

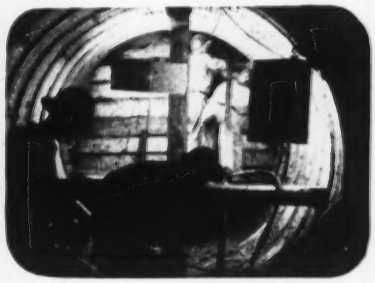
  Commissioners hastened to add that the separate steel bids aren't a departure from announced policy of awarding "package" contracts for the toll way. Contractors who get the five-mile road contracts will also get erection contracts for the steel.

THIS SEWER DIDN'T STOP AT

Threading Armco ASBESTOS-BONDED Pipe through Conduit.



Shaft at start of tunnel.



Building Tunnel. Jack projects poling plates.

How would you put a new municipal sewer under a main-line railroad? This midwestern job is typical of how many cities do the work — without slowing down trains or sewer installation.

First, they dug a shaft near the tracks. Then they tunneled under the railroad with Armco Liner Plates. It was easy to add successive rings because one workman could carry, hold and bolt an Armco liner section into place using only standard tools. Job costs were low. Equally important, the corrugated Armco Liner Plates assured a strong, safe structure.

Next step was to thread the 96-inch diameter Armco ASBESTOS-BONDED Sewer through the 108-inch diameter conduit with a block and tackle. The project was completed quickly, easily and economically.

There is an efficient, economical Armco Structure to meet every sewer construction need. Consider plain galvanized pipe for normal conditions, PAVED-INVERT to combat erosion and ASBESTOS-BONDED to handle severe corrosion. Armco MULTI-PLATE makes sturdy, large waterways and either standard or MULTI-PLATE Pipe-Arch is ideal under limited headroom. Useful construction tools include Armco Liner Plate and flange or interlocking sheeting.

Both engineers and contractors find that Armco Sewer Structures have many definite advantages. Write for complete data on your specific problem. Armco Drainage & Metal Products, Inc., 1253 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

ARMCO SEWER STRUCTURES

ARMCO

Decision on higher interest rates for FHA and GI mortgages was put squarely in the lap of HHFA chief Albert Cole. He had had the job for the past couple of weeks of getting concurrence of all those who have to go along. Most officials—congressional committee chairmen, Treasury and White House—gave their okay to Cole.

The higher rate on GI loans has been the big bottleneck. American Legion, the strongest single pressure group in the field, had been reluctant to approve the proposed rate increase. And Carl Gray, VA chief, who has the authority to raise the VA rate—doubted that a rate increase would end "the evil of discounting GI mortgages."

Gray stuck to this point: Since Congress ordered a 4% rate on VA direct loans to veterans, he couldn't take the responsibility for approving higher rates on private loans that VA guarantees.

•

One "out" that has been politically attractive: keep the 4% rate that has become a symbol of the GI mortgage. But specifically authorize lenders to discount loans—in other words, let them lend $9,700, for instance, on a mortgage with a face value of $10,000.

•

Question: Has the hold-down on interest rates held down housing starts?

So far this year, the percentage of mortgages without government guarantees has been increasing.

Lenders have held down on VA and FHA lending ever since the government announced the 3¼% rate on its new long-term bonds—they've been waiting for higher yields. But the number of housing starts this year has held up to last year's level—which, if continued, would give us a million or so starts.

Housing officials see no drop in home-buying because of higher interest charges. An increase of ¼% on a $10,000 mortgage, for instance, would raise monthly payments by about $1.40; a ½% increase by about $2.60.

Everyone agrees, however, that a further delay would have a slowing-up effect—that starts would drop off . . . during the critical housing months of May and June.

•

Look for military construction awards to begin climbing. The department is over the hump on its complete review of all new starts and projects less than 20% completed. There will be a peak on awards along in June and July.

•

St. Lawrence Seaway got a boost from Eisenhower. He had already backed New York's bid to build the U. S. portion of the power project. But last week he said that his National Security Council favored the seaway project as a defense measure—and that he goes along with this.

•

Exempting the construction industry from the Taft-Hartley law is in serious consideration in Congress. Senate leaders on labor legislation are considering ways and means to write the exemption into a bill. The idea will come out into the open before the Senate Labor Committee closes hearings on Taft-Hartley amendments next week.

Exempting small business and electric utilities also is being talked. The theory: Building trades, electric utilities and small business are predominantly local activities, and Washington should get out of their affairs. The exemption would force states to handle their own labor troubles.

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Notice the short-throw "Speed-o-Matic" levers. They operate at the touch of a finger.

Operators world-wide prefer the fast, easy, trouble-free *Speed-o-Matic* operation

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HOWARD EARL DEGREENIA, Westfield, Mass. — "It doesn't jerk like other rigs I've run."

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New Bureau of Reclamation chief faces retrenchment

House committee recommends curtailing of construction; proposes reduction of regional and district offices

The new Administration had the Bureau of Reclamation well under its wing in Washington last week. It finally put its man in the Commissioner's office, while on Capitol Hill a House committee voted a sharp cut in construction funds and favored closing down a number of regional and district Reclamation offices.

To the Commissioner's post—last of the top Interior Department jobs to be filled—the Administration appointed Marvin C. Nichols, Fort Worth civil engineer, who has had wide experience as a consultant on water supply problems in the Southwest.

Nichols had been the top choice of Interior Secretary Douglas McKay during the past several weeks of speculation. But, there were delays in getting his appointment cleared politically. He is a states rights Democrat who voted Republican in 1952.

• **Construction program cut**—In Congress, the House received the final recommendations from its Subcommittee on Interior Appropriations. The committee's program calls for considerably less money for Reclamation construction than even the revised Eisenhower budget requests (see table). Actually, it provides little more than $108 million in new funds, but carryover funds bring the figure to $150.8 million. Thus, the committee can show an appropriation cut of $85 million below the Truman construction figure, which made no allowance for carryover funds.

In effect, the committee would reduce the 1954 construction program by 22%. But the use of carryover funds cuts the construction appropriation by 45%.

The House committee acted before it got the Eisenhower budget revisions. Consequently, some of its actions differ from Administration decisions. The committee, for example, approved money for Webster and Kirwin dams in the Kansas River basin. But the Budget Bureau asked that these jobs be stopped, along with Tuttle Creek (ENR April 23, p. 21).

The substantial savings effected by the House committee were accomplished chiefly by cutting appropriations requested for fiscal 1954 on a list of projects rather than by halting work on jobs under construction.

The House was expected to go along pretty well with the committee recommendations. But, there were indications pressure for some upward revisions would be exerted in the Senate.

• **Retrenchment proposals**—On reorganization of the Bureau of Reclamation, here is what the House committee would like Nichols to do:

• Make Denver the only staff office.

• Reduce Washington to a liaison office.

• Cut the regional offices from seven to five and the district offices from 18 to five.

ACTIONS ON RECLAMATION'S CONSTRUCTION BUDGET

(Prior to consideration by House)	Truman budget	Eisenhower budget	House Appropriations Committee action
Total for bureau programs	$193,888,000	$164,412,000	$150,874,998
Webster Dam, Kansas	6,080,000	0	5,000,000
Kirwin Dam, Kansas	8,359,000	0	6,500,000
Missouri River division, Montana-North Dakota	5,263,000	0	2,000,000
American Falls power plant, Idaho	559,000	0	0
Deer Creek power plant, Utah	200,000	0	0
Roza power plant, Wash.	778,000	0	0
Colorado River flood protection	1,905,000	0	150,000

MARVIN C. NICHOLS of Fort Worth, Tex., fills last key post in Interior Department.

Reductions in personnel must be made to effect a saving of $1 million in administrative expenses. The committee cut this item to $4.25 million from the Truman figure of $5.25 million.

Reclamation personnel has been maintained at a present figure of about 13,800, according to the committee staff, in anticipation of bigger construction programs than Congress has approved in recent years or will approve in the future. Bureau employees totaled slightly more than 7,000 in 1940 and held at about that level through the war years to 1945, the committee noted.

The staff study, as reported by the committee, also suggested merging of Reclamation and the Bonneville, Southwestern and Southeastern Power Administrations into a single Division of Interior. This consolidation could mean a big saving in offices, personnel and administrative costs, the report suggested.

Reorganization of the Reclamation Bureau and of other Interior agencies rests primarily with Undersecretary Ralph Tudor. McKay is relying on Tudor to work out improvements.

President Eisenhower was waiting to appoint Nichols to the job, which does not require Senate confirmation. The nomination would have come through much earlier save for a political mixup.

In clearing their candidate through the political mill, Secretary McKay

and his top aides accidentally bypassed Republican Committeeman Jack Porter, big Texas oilman who helped swing the state to Eisenhower.

Porter blocked the nomination in no uncertain terms. Then he had a change of heart and gave McKay the go-ahead. With peace restored, the Secretary sent Nichols' name to the White House.

• **Faces many knotty problems**—Nichols fills the bill on qualifications for the post, as drawn up by the new administration. He is an engineer of recognized ability, from a reclamation state outside the Colorado Basin, and he has never been a bureau employee.

Tough problems face the new commissioner. Decisions have to be made on a long string of knotty questions ranging from policy matters to reorganization of the bureau and reduction of personnel. Nichols will get only a last-minute whack at the budget under which he must work.

• **Familiar with water supply**—But Nichols has the ability to meet the severe test, in the opinion of his Interior Department chiefs. He has been city engineer of Amarillo, Tex., and a consulting engineer-partner for 25 years in firms specializing in hydraulic problems, most lately with Freese and Nichols, of Fort Worth. During World War II, this firm handled the architect-engineer contracts for 21 major installations of the Army, Air Force and Navy.

At various times during the same years, Nichols has served on city planning and zoning commissions and as chairman of the Texas State Planning Commission. He is an active member of numerous professional and technical societies and of businessmen's associations.

Conservation and use of water are familiar themes to Nichols. He has worked as a consulting engineer on water supply problems and projects for more than a dozen Texas cities and for many other municipalities, districts and private clients in the Southwest.

• **Middle-of-road views**—On matters of national policy, Nichols describes himself as a conservative states rights Democrat who voted the Republican ticket in 1952. As an example of his thinking on questions of the kind he will face as commissioner, he had this to say recently on ownership of land adjacent to federal reservoirs:

He favors the federal government's owning "only the minimum amount of land necessary for accomplishment of the primary purposes for which the reservoir was built at federal expense." Beyond that, Nichols went on, he does not favor the government's acquiring by condemnation land to be used primarily for recreation and similar purposes.

On broad construction and operating policies for the Reclamation Bureau, Nichols will support strongly the views enunciated by McKay, for the entire Interior Department. Those views received strong endorsement last week in a policy statement by the House Appropriations Committee.

• **Emphasis on private interests**—In the committee's opinion, Interior should carry on only those functions and activities which private enterprise cannot or will not undertake. And where private enterprise cannot develop resources completely without help, the committee calls for a working partnership between the federal government and private interests. In such an arrangement, the private interests should do as much of the development work as they can and thus put addtional property on the tax rolls.

As to construction activities, the committee says that Interior should complete essential projects now under way to avoid waste of federal funds. Wherever possible on these projects, however, the department should take in private partners to build, own and operate those parts of the development that can be privately owned with full protection to the interests of all the people.

For all future projects or new starts that include transmission lines, the commitee specifically recommends that Interior urge private enterprise to take the initiative in constructing the lines before putting any federal money into such construction.

These committee statements coincide closely with policy declarations by McKay. They summarize the ground rules for future operation of the Reclamation Bureau. Nichols is counted upon to carry out the declared policy.

Three air research projects deferred

The House of Representatives has eliminated three construction projects from the National Advisory Committee for Aeronautics budget for fiscal 1954.

The House went along with Appropriations Committee action in "deferring the three lowest priority projects": $8.5 million for rocket engine research laboratory; $1.3 million for a supersonic tunnel; and $179,000 for alteration of another tunnel.

The bill which the House sent to the Senate made no change in the figures voted out of the Appropriations Committee. All told, the NACA got $7.2 million for construction of a half-dozen research facilities at a number of laboratories around the country.

NATO program

Host nations will build $885 million European defense installations

The NATO Council in Paris last week voted a four-year $885-million construction program for airfields, enlargement of supply ports, a radar warning system and other military works. Approval by the parliaments of the member countries and appropriation of money may be expected to follow.

Practically all of the NATO construction will be performed in European countries. Few American engineers or contractors will participate.

Under NATO procedure, installations are assigned to the countries in which the works are located, in the same manner as became common during the Lend-Lease program of the last war. The host country assumes responsibility for design and construction. Ordinarily, the government of a host country awards contracts only to its own nationals.

Construction procedures are those of the host country, within the limits of broad standards supplied by SHAPE. A NATO infrastructure committee reviews the accomplishments of each project. Upon approval by this committee, disbursing officers make payments to the host government for work performed.

West Virginia Turnpike jobs to be broken up

A greater number of West Virginia construction companies will get contracts for the 88-mi superhighway between Charleston and Princeton, according to current plans of the West Virginia Turnpike commission.

Executive director Ray Cavendish was authorized by the commission to poll all contractors in the state to determine if they are interested in bidding on smaller projects. Only about a half-dozen firms have bid on the grading work let to date. That work amounts to about 40% of the total.

The commission plans to break future big contracts up into smaller jobs for bidding. Carl Peterson, project engineer, warned the commission that reduction of re-advertised projects into smaller jobs could result in a five-week delay just when the construction season is getting under way.

Missouri Basin groups oppose halting Oahe and Tuttle Creek dam projects

Strong case developing for Oahe on basis of funds already invested and erosion damage if work ceases

Grassroots opposition is developing over the Budget Bureau's recommendation that two major Missouri Basin projects—Tuttle Creek and Oahe Dams—be denied appropriations for fiscal 1954 (ENR April 23, p. 21).

The Truman budget had recommended $15.8 million for Tuttle Creek, which is under construction across the big Blue River a short distance from its mouth at Manhattan, Kan., and $14.8 million for Oahe, world's largest rolled earth dam, on the Missouri River above Pierre, S. D.

River groups have pledged themselves to a campaign to get their congressional delegations to work for reinstatement of the projects, when appropriations for Army Engineer civil functions come up for action in the House and Senate.

• **Point to erosion risk**—Oahe backers are looking to several factors to help them keep work going on this $319-million dam. Their prime talking point is that $18 million already has been spent. And, although Oahe is only 7% complete, more earth has been put into place than will be placed for the entire Gavins Point Dam project, another mainstem structure downstream at Yakton.

They've already received a promise of strong support from Senator Francis Case, who declared in Washington this week that "so much is invested that what has been accomplished so far ought to be conserved. . . . I feel that the complete elimination of the project from this year's budget would prove costly."

Senator Case strongly emphasized that Oahe is an earthen dam and if work is stopped considerable erosion will result. "We have been getting $2 to $3 million a year for Oahe and I would say that if we got half of the Truman budget proposal—$14.8 million—it would be more than we ever got before

• **Tuttle Creek opposition strong**—Tuttle Creek Dam supporters can look to no such wholehearted congressional support. Representative Howard S. Miller, who was elected on an anti-Tuttle Creek platform, is hailing the Budget Bureau's action. Other congressmen, mindful of the Miller victory, may decide not to push the issue.

Furthermore, the Kansas legislature asked Congress not to appropriate additional money for Tuttle Creek. This was done on the basis of recommendations by a committee of consultants named by Governor Edward Arn to study the Kansas Basin program of the federal government (ENR Mar. 5, p. 21). The consultants' preliminary report opposed further dam construction and recommended a system of floodways and setback levees to control Kansas River floods.

Despite these considerations, Senator Frank Carlson said this week in reference to Tuttle Creek and Toronto Dam (an Arkansas Basin project for which the Budget Bureau also declined funds) that he thought elimi- of these projects" should be thoroughly reviewed."

NOTHING LIKE COMPETITION grading of a 16-acre site for the new $2.2-million Minneapolis-Honeywell plant at Gardenia, Calif.—a job that normally would take at least three weeks—was accomplished over a recent weekend by making the operation a benefit performance. Eighty firms participated in the friendly rivalry staged as a fund-raising project of the Los Angeles Chapter, Excavating and Grading Contractors Assn. Utilizing $3 million worth of equipment, crews moved and compacted 30,000 yds and hauled away an additional 5,000 to 6,000 yds in two eight-hour shifts. The area was divided into sections, to each of which a group of companies was assigned. A central radio control car coordinated the operation, with the help of radio-equipped liasion men in each of the strips. The contractors donated the equipment and manpower. Minneapolis-Honeywell paid the association what it would have spent to get the job done in the usual way. Both sides reported mutual benefit.

Georgia's two bridge authorities begin work

Georgia is tackling its bridge building requirements under a unique setup created at the recent session of the state legislature. It now has one authority to handle construction of free bridges and another for toll spans.

Purpose of the free bridge authority is to speed replacement of old bridges which are becoming costly to maintain. It has financing powers that will enable the work to be done more quickly than possible as part of the regular state highway program.

The free bridge authority is empowered to sell revenue bonds, with a limitation of $30 million in outstanding obligations the authority is to construct the bridges and lease them to the state highway department. State funds now going for maintenance will pay interest and amortization.

As a start, the bridge authority has agreed to finance construction of eight bridges costing $8.9 million. Counsel for the authority sees the initial move providing a necessary court test through bond validation proceedings.

Its first objective has been to seek federal consent for making the Turtle River bridge nea Brunswick a toll project. The bridge, about two-thirds complete, will require about $4.5 million more money.

Policy hearing

Grange, airlines testify on federal road policies

The House Subcommittee on Roads continued its hearings on federal highway policy this week by getting from such diverse sources as the National Grange and the Air Transport Assn. their slant on how gas tax revenues should be used.

J. T. Sanders, legislative counsel for the Grange, opposed any tampering with the 1944 Highway Act formula which allocated 30% of federal-aid funds to secondary roads. Since then, of course, Congress has gone outside that formula to authorize separate federal-aid funds for the interstate system.

Sanders' testimony stressed two points: 1. Stopping gas tax diversion in the states where it persists, and 2. need for more research work on highways, particularly rural roads. He also agreed that the federal government should speed research on vehicle size and weight standards.

S. G. Tipton of the Air Transport Assn. said the airlines favor earmarking for highway purposes all federal revenues from excise taxes on automobiles, trucks, tires, tubes, motor fuel and lubricating oil—a proposal contained in two bills now before Congress.

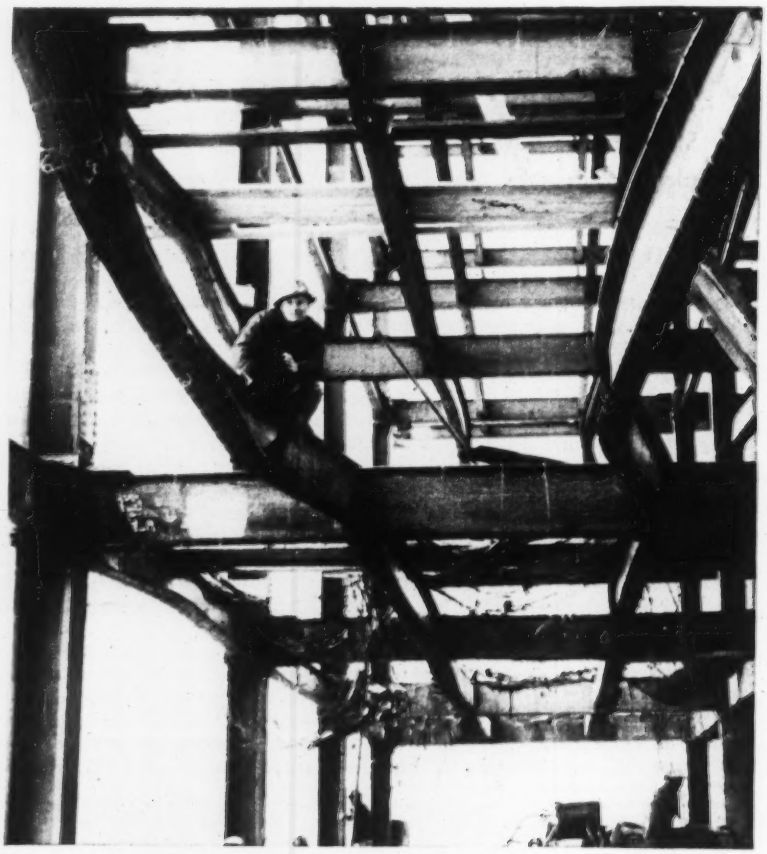
But the airlines want to exclude taxes collected on aircraft tires, fuel and oil.

Tipton submitted an amendment to this effect for inclusion in any bill that Congress might consider. Some committee members contended the airlines gain from construction and improvement of highways serving airports.

A sudden shift in the committee's schedule last week required postponing the appearance of Gov. Alfred E. Driscoll of New Jersey (ENR April 23, p. 21).

Engineers to direct flood operations from helicopters

A stand-by fleet of helicopters has been arranged for by St. Louis Dist., Army Engineers, for use in directing emergency measures in future Mississippi and Illinois River floods. Arrangements have been made for four privately owned helicopters to be rented in any flood emergency and equipment of helicopter operators within a 400-mi radius of St. Louis is being surveyed. The helicopters would carry radio equipment to relay flood information and instructions and serve to evacuate persons marooned by floodwaters.



Fire warps Dallas skyscraper frame

Many horizontal beams from the 17th to the 21st floors in the steel frame of the 36-story Republic National Bank building in Dallas, Tex., will have to be replaced as a result of their being warped and bent by the recent five-alarm blaze that broke out on a wood floor form. Damage has been assessed at $700,000.

Engineers and architects were fearful that important steel columns also might have been ruined, creating a difficult engineering problem in view of the stories of steel frame which were already in place above the level of the fire.

Initial tests, however, indicated no injury to steel columns as far as vertical alignment is concerned. Glenn R. Ingels of Houston, metallurgical consultant, cut shingle-size samples of the steel most exposed to the fire to make tensile strength tests.

Despite the fire, General Contractor J. W. Bateson of Dallas, announced the $17-million structure—highest in the Southwest—would be completed in April, 1954, as scheduled.

He said work would be rushed on the banking section of the building while clean-up operations go on in the office tower. In addition, concrete will be poured in floors above the fire-damaged section and topping steel 36 stories above street level will be put in place.

Fire inspectors believe a smoldering fire left in a wheelbarrow or container may have caused the blaze. Workers placing wood forms for concrete floors had been warming themselves at such fires during the day. The blaze broke out about 5 pm.

British Columbia votes record highway program

The biggest highway construction program in British Columbia's history will go ahead this year. The province's public works department is sharing 50-50 a $12-million expenditure with the federal government on the Trans-Canada Highway in British Columbia this year and will spend another $15 million for new roads, bridges, ferries and wharves.

In addition, $10,350,000 is being allotted for road maintenance. Another $2.5 million is set aside for a new provincial jail and $4 million for other projects.

Current trends in industrial design highlight AISC engineering conference

Higher ceilings, larger bays provide more flexibility of operations and better working conditions.

Significant trends in industrial plant design and construction—based on the needs of the owner—point to improved labor relations through providing better working conditions. Contemporary designs also stress maximum flexibility of manufacturing operations and more efficient use of new building materials.

These were some of the challenging and thought-provoking issues raised at the fifth annual National Engineering Conference of the American Institute of Steel Construction held in Detroit last week.

Architects, engineers and fabricators attending the two-day conference were brought up-to-date on recent trends in industrial plant design by R. F. Giffels, secretary-treasurer, Giffels and Vallet, Inc., Detroit.

• **Broad influences at work**—"Despite the endless variety of functional needs and disparity in operating conditions, there are broad influences affecting the design of industrial plants," Giffels said. "Foremost of these is a great concern on the part of management with regard to improved labor conditions. Management also recognizes the need of maximum flexibility in plant arrangements because of the ever-changing nature of manufacturing techniques."

"Development of new products and new manufacturing processes is requiring better control of conditions of temperature, humidity, dust elimination, and lighting," declared Giffels. New building materials and building service equipment not only permit, but stimulate, new trends in design, while more attention is being given to the economics of investment in plants.

Giffels said he hears considerable talk of dispersal of industry as a defense measure. However, he seldom finds his clients giving it much weight in site selection.

• **Plant layout and design**—Certain predominant trends are notable in the details of plant layout and design, asserted Giffels. "As for many years past, most industrial buildings are one-story, but quite a change has been taking place in what we call the shell of the building. It is becoming a flat topped box. Roof monitors are definitely on the wane. The area of side wall sash is diminishing and sometimes omitted."

There also is a significant trend toward reducing masonry. Steel or aluminum panels, with or without insulation, have firmly established themselves in industrial design. In addition, construction with, "tilt-up" concrete panels is increasing. "We haven't found, however, a good substitute for the lower 5 or 6 ft of curtain walls," declared Giffels.

The speaker intimated that both the height of one-story factories and bay dimensions are increasing. Clear heights of 18 to 20 ft are becoming nearly as common as 14 ft used to be. Such clear heights allow the installation of monorails, overhead conveyors, and ducts when the plant is built or as future use requires. There is a particularly noticeable trend toward wider column spacing longitudinally as well as transversely. Bay spacings have been increased from 20x50 ft up to 40x60 ft, or even 60x60 ft. In our own practice, concluded Giffels, we tend to more simple structural designs, in which we perhaps use a little more steel, but with lower fabrication and erection costs.

• **Construction responsibility**—"Construction is Everyone's Business" was the theme of a talk by George H. Miehls, president, Albert Kahn Associated Architects and Engineers, Inc., Detroit. He warned the conference that for effective results, the construction industry must have imaginative and inventive management, with adequate financial and technical resources. It must also have adequate materials and ample labor.

"In times of high taxation and controlled economy," declared Miehls, "there is a tendency, or at least a temptation, to curtail quality of construction with its lower maintenance costs and substitute construction of lesser quality even though it entails increased maintenance. By doing so you expend less capital dollars and have an opportunity to recoup your expense dollars in the cost of the product."

But there is danger in this, warned Miehls. In periods of high taxation and free competition—a period which we are now entering—high maintenance costs may become a serious burden. By adding them to the cost of the product certainly lesser profit results, he said.

• **City-County Building**—From the standpoint of the use of structural steel in big building construction, Benson J. Wood's description of Detroit's $26-million City-County Building was one of unusual interest to members of the conference. Wood is chief structural engineer for Harley, Ellington and Day, Inc., architect-engineers on the project.

The building is composed of two units, one containing 20 floors and the other 14. The building will provide more than 10,000,000 cu ft of space and nearly 750,000 sq ft of floor area. There are 8,190 tons of structural steel in it, and 450,000 sq ft of cellular steel floor construction topped with lightweight concrete. By using lightweight floor construction and fireproofing in lieu of conventional stone-concrete floors and fireproofing, a saving of 1,000 tons of structural steel was made, said Wood. This also permitted a material reduction in the cost of foundations, which are concrete caissons founded on hardpan. The building is scheduled for completion in June, 1955, he said.

• **Off-street parking**—A strong point in favor of providing more off-street parking was made by Ellis E. White, vice-president in charge of engineering, Multi-Deck Corp., Beverly Hills, Calif. It is now time, he warned, to consider the market for more and better parking facilities through private enterprise.

"The 30-year-old parking industry has become a $3-billion one," declared White, "and we can expect a real upswing in additional parking facilities during the next 10 years."

Pipeline river crossing completed in Canada

Canada's biggest pipeline river crossing job has been completed on the Fraser River near Vancouver, B. C., with the pulling across the river bottom of 2,250 ft of concrete-encased 24-in. pipe in the $92-million Trans Mountain oil pipeline project.

The pipe was eased across the river by two 1¼ in. steel cables attached to winches. A trench was dredged to a depth of 15 ft in the river bottom and four steel pontoon floats were used to guide the pipe across the river with cables keeping the nose of the pipe from digging into the river bed. Total length of the crossing from high ground at Maillairdville, near New Westminster to Port Mann on the south side of the river was 5,700 ft.

Missouri Valley Canadian Ltd. of Vancouver had the contract for the crossing, under Canadian Bechtel Ltd., Trans Mountain subagents. Dredging was done by B. C. Bridge and Dredging Co.

Change in dam design saves $40,000

Denver water department engineer suggests setting spillway section 6 ft upstream from main structure

A change in dam design suggested by an office engineer will save the city of Denver $40,000, Manager Earl Mosley of the Denver Water Board has disclosed.

The suggestion came from A. D. Daum, office engineer on the Denver Water Department's dam and reservoir No. 22 in South Boulder Canyon, 32 mi northwest of Denver. He's been with the board less than three years.

Daum proposed that the 160-ft spillway section of the concrete dam be set 6 ft upstream from the main structure. This leaves a 6-ft-deep groove in the downstream face of the dam.

"In this way the main dam itself will act as training walls for the spillway and direct the flow of water," according to D. D. Gross, consulting engineer for the water department.

Previously it had been planned to construct concrete training walls, 8 ft high, on the downstream face of the dam to guide water flowing down from the spillway.

Mosley said the training walls would have been temporary anyway and would have been removed when the height of the dam is increased as planned in another 10 years. Present plans call for the dam to be raised 110 ft above the 340-ft top of the structure now being built.

The off-set spillway plan has been used in Europe, Mosley said.

The Macco Corp.-Puget Sound Bridge & Dredging Co., builders of the dam, said they would make the change in their plans and would reduce their charge by $40,000.

Civil engineers' income averages $7,100

Bureau of Labor Statistics report covers education, specialization among professional engineers

Average annual income for civil engineers 35 years or over is $7,100—lowest in the engineering profession—according to a study issued by the Bureau of Labor Statistics.

The report, entitled "Employment, Education and Income of Engineers, 1949-1950," is based on the results of a survey made by the Engineers Joint Council for the Department of Defense. Its purpose was to supply information as to the engineering skills available in this country.

The survey was limited principally to men in the full professional grades of the five societies then making up Engineers Joint Council (ASCE, ASME, AIME, AIEE and ACHE) and to members of the National Society of Professional Engineers. Members of these six societies made up most of the 55,000 covered although questionnaires went to 18 organizations in all.

Those surveyed were asked to give information on their major field of specialization and their three highest fields of competence. Supplemental information included their education and degrees held, of work and employment, their age and income.

• **Fields of activity**—In the major fields of engineering, the largest number of the engineers reporting (14,635) were in mechanical engineering, with civil engineers a close second with 13,309. Curiously enough, in the more detailed breakdown according to fields of competence, civil engineering leads with 13,857; mechanicals dropped to 6,664. In the breakdown of civils, construction led with 2,727, followed by structural, highways, general civil and sanitary.

• **Income**—Income studies included only men of 35 or over. Of these, the largest number 29.1% were in the $5,000-$7,000 group; 25.1% in the $7,999-$9,000 group, and 14.4% in the $9,000-$11,000 group.

By specialization, the median annual income for civils was lowest—$7,100, but the range was not wide, the top brackets being "other engineering" ($9,100) and chemical engineering ($9,000).

This tabulation could be used as a good argument for obtaining a doctor's degree as the men with such degrees stand at the top of the list in each classification. The report showed that few engineers who go on to obtain a doctor's degree ever go into business for themselves. Nearly all with doctor's degrees are either employees of private industry or government, or are in education.

• **Types of employment**—Private industry employs 65.8% of all the engineers reporting. Government comes second with 17.1. In the field of civil engineering, however, government employment leads with 42.8%. Private industry is second with 34.5%, 9% are in private practice, 8.3% are employers or owners of business, and 4.9% are in educational work.

Copies of this report may be obtained from the Bureau of Labor Statistics, 14th Street and Constitution Ave, Washington 25, D. C. upon request.

California OK's proposed $207-million federal job

California has given its approval to the Bureau of Reclamation's proposed $207-million Trinity River Dam project, the state's report forwarded to Interior Secretary Douglas McKay urges that it be "constructed at the earliest practicable time."

The Reclamation Bureau's plans call for a dam nine miles above Lewiston in northern California with a reservoir capacity of 1,800,000 acre-ft, a smaller diversion dam seven miles downstream and 17 miles of tunnel to carry water eastward to the Sacramento River between Shasta and Keswick Dams. There would be powerhouses at both dams and at the end of both tunnels, with a capacity of 218,000 kw.

The main Trinity Dam would be an earthfill structure 410 ft high and 3,000 ft long at the crest.

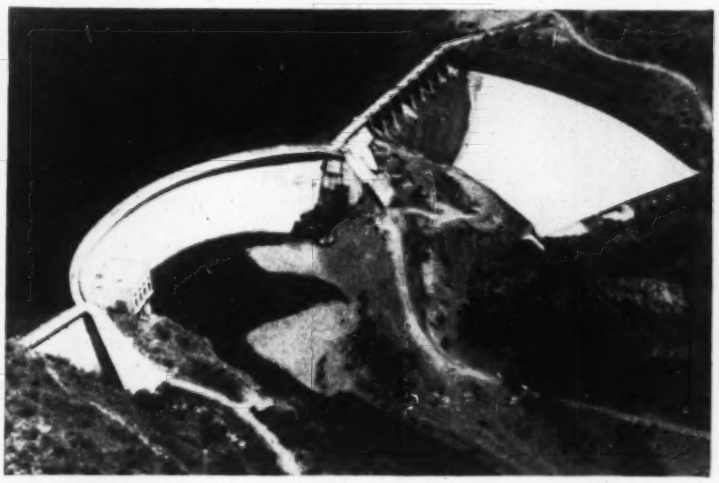
The bureau advocates integrating the Trinity River project into the Central Valley project.

University of Michigan plans centennial events

Faculty and students of the University of Michigan's College of Engineering are laying plans for its 1953-1954 engineering centennial.

The official centennial program is scheduled for October 23-24, but other events commemorating 100 years of engineering instruction at the university will take place throughout the year.

Engineering courses began with the appointment of Alexander Winchell as professor of civil engineering and marked the beginning of the first technical school in the West. The college today lists ten engineering departments in addition to the Engineering Research Institute, opened in 1920, and the Willow Run Research Center, acquired in 1947. During 1951-52, the Engineering Research Institute administered 239 research projects. Of these 124 were industrial projects and 115 were sponsored by the government.



A RENOVATION JOB has been done on the 23-year-old Stewart Mountain Dam on the Salt River in Arizona to halt leakage and prevent further arch movement caused by saturation of concrete.

Grouting stops Arizona dam leakage

Leaks in Arizona's Stewart Mountain Dam have been plugged in a $200,000-grouting job, which engineers hope also will stop movement of the arch resulting from saturation of the concrete by a full reservoir.

The dam, a 207-ft high arch structure with a 1260-ft long crest, is located on the Salt River about 41 miles from Phoenix. Completed in 1930 at a cost of $2.8 million, the dam impounds 70,000 acre-ft of water and serves power and irrigation needs.

Leakage developed principally in horizontal joints formed by the 5-ft construction lifts. The grouting operation involved making 79 diamond drill holes, each 1¾ in. diameter. The holes varied in depth from 50 to 115 ft with a total length of 6,250 ft.

The grouting also was aimed at making the structure denser to prevent movement. Penetration of water into the cracks between lifts and into what must have been porous concrete caused the dam to swell. Result was an upstream creeping movement of the arch amounting to as much as 10 in. Engineers attribute the trouble to poor workmanship and older methods of concreting.

While leakage was being repaired, the dam's radial gates were sandblasted and zinc-treated and the penstocks blasted and overhauled. The nine gates are 25 ft high and 27 ft wide. Along the edges of the gates rubber gasket seals were fastened with zinc-coated bolts.

GROUTING stopped leaks like this. They developed principally between 5-ft concrete lifts.

Work was under the direction of the Salt River Power District engineering division with C. H. Whalin as engineer in charge. Carl E. Bowers was resident inspector. O. E. Boggs, engineer from Bureau of Reclamation's Denver office, was consultant. Prime contractor was Fisher Contracting Co., of Phoenix, with Continental Drilling Co. as subcontractor. Work took three months.

Antitrust case

Sand and gravel companies face contempt charges

Attorney General Herbert Brownell coupled some strong words about antitrust law enforcement with deeds last week by filing criminal and civil contempt proceedings against the Western Pennsylvania Sand and Gravel Assn. and five member companies in Pittsburgh for violation of a consent decree signed 13 years ago in another antitrust case.

Brownell warned that "stern measures are required against persons who wilfully disobey orders of the courts and obstinately persist in their violations of the law."

The defendants were named in a new criminal indictment under the antitrust laws by a federal grand jury at the same time the contempt proceedings were filed. They have until May 25 to make a plea or throw themselves on the mercy of the court. Justice Department lawyers, however, are expecting a plea of not guilty and look for the usual round of involved legal motions to follow.

The companies named—Dravo Corp., J. K. Davison & Bro., Iron City Sand & Gravel Corp., McCrady-Rodgers Co., and George M. Davison—produce, transport and sell sand and gravel. They were prosecuted in a 1940 case on charges of conspiring to fix prices and agreeing on prices quoted on government projects. The consent decree, signed by the association and all the companies, was designed to stop the illegal practices.

The government charges the companies "promptly re-engaged in the same illegal activities, which not only violated the decree but also constitute a new violation of the law."

The government suit asks punishment for the criminal contempt and orders an end to the practices and dissolution of the association.

In the last 20 years, Democrats had trouble keeping up with enforcement of consent decrees in antitrust cases—filing big cases against big companies was easier and more popular with them. Though Democrats had the sand and gravel contempt proceedings under way when Brownell took over in January, his following through may indicate a change in approach by the Republicans and a determination to keep closer tabs on compliance with antitrust settlements.

The Justice Department has several other cases pending which involve suppliers of construction materials and construction labor practices to consider (ENR April 9, p. 22 and 31).

SECRETARY DURKIN: No policy statement.

AFL PRESIDENT MEANY: More construction.

Meany sees prosperous peace based on more construction

Labor and management representatives of construction industry turn out to honor leader of AFL

It was a construction industry show all the way—that New York City AFL testimonial dinner to George Meany, president of the AFL, on April 25, in the Hotel Commodore. Construction employers were prominent in the audience and on the dais, and construction labor leaders ran the affair for "Brother" Meany, who told them to depend upon construction to maintain a prosperous peace.

Even Danny Kaye, who left the stage of the Palace Theater to pay a tribute to his friend George, reminded the audience that he was at one time under the tutelage of one of his (Kaye's) brothers as an apprentice electrician. (Until he fell through a couple of beams.)

But perhaps the most attentive people in the overflowing crowd of about 2,000, were the contractors. Probably they expected to hear some statement of importance from Labor Secretary Martin Durkin, who was making his first public speech since joining the Eisenhower administration. In this they were disappointed. Durkin eulogized Meany and sat down.

But still the feeling of being at ease with plumbers Meany and Durkin persisted among the employer groups a feeling best expressed by Peter W. Eller, chairman of the board of governors of the Building Trades Employers Assn. of New York City, who said:

". . . I can speak for . . . contractors, 1,000 in number. . . .

"George Meany . . . has championed . . . the right of men through the trade union movement to bargain collectively for collective improvement. . . . At the same time he has insisted no less upon collective responsibility—and responsibility for those who bargain for others to continue diligently to keep the bargain.

"We (the BTEA) belive that we, too, have and should continue to have the right to bargain collectively and the right to collective security. **In the building industry . . . it cannot be otherwise, doctrinaire or legislation to the contrary."**

• **Construction for peace**—During his address Meany challenged the concept that prosperity would suffer in the event of a more peaceful world situation.

"Today," he said, "our prosperity is based largely upon defense spending and upon heavy investments in facilities for even greater defense production in the future. Some skeptics . . . do not believe in the ability of America to maintain a high level of prosperity in peacetime.

"I challenge that view. To my mind, we haven't begun to do in America what urgently needs to be done. We need thousands of new schools for our children. We lack adequate hospital and medical facilities in almost every community. Our cities have become run-down and blighted by slum areas and outmoded factory districts that need to be rebuilt. Our roadways have been sadly neglected and require a vast program of construction and modernization to take care of the heavy flow of traffic. There still exists an acute shortage of low-cost housing for millions of Americans who cannot afford to pay the high prices demanded by the current market. All these needs have to be filled and American industry and labor will have plenty of work for years to make up for past neglect."

Meany, with these words, joined those administration officials who during the last weeks have been holding out the hope of continued prosperity based on an accelerated construction industry program in peacetime.

Construction firm's suit against union upheld

A damage suit by Laburnum Construction Co. against the United Mine Workers has been upheld by the Virginia Supreme Court, although the lower court's award of $275,400 in damages was reduced to 129,300.

The company, with headquarters in Richmond, Va., had sued for $500,000, charging that UMW threats and coercion caused its employees to leave a construction job in the Kentucky coal fields in 1949.

The Virginia court rejected union arguments that the dispute was subject to the federal Taft-Hartley labor law rather than under state jurisdiction. Federal legislation, the court said, had not deprived the states of their traditional power and jurisdiction to deal with unlawful conduct.

In some cases, particularly in Wisconsin and Michigan, the U. S. Supreme Court has set aside application of state laws because of conflict with Taft-Hartley. The Goldwater bill in the Senate and the Lucas bill in the House would, among other things, amend Taft-Hartley so as to assure that the federal law would not interfere with the rights of states to regulate picketing and strikes.

Exemption?

Taft considers proposal to exempt construction from Taft-Hartley Law

A suggestion that the construction industry be exempted from the Taft-Hartley Labor Law has captured the interest of Sen. Robert A. Taft, the man who will have most to say about how Congress revises the law.

President Richard J. Gray of the AFL Building and Construction Trades Department made the suggestion to contractors in a Washington speech last month. (ENR, March 5, p.28).

Taft expressed interest in it last week when Gray testified before the Senate Labor Committee.

Listening to Gray's complaints over inability to make pre-job labor contracts or make the union shop effective in construction because of the casual nature of employment, Taft commented that Taft-Hartley really was not intended to apply generally to construction. He expressed himself similarly when Secretary of Labor Martin P. Durkin was before the committee seeking confirmation, pointing out that Taft-Hartley is simply a revision of the Wagner Act, which was aimed at the manufacturing industries. (The National Labor Relations Board never applied the Wagner Act to construction.)

How would Gray feel, Taft asked, if the construction industry were declared not to be in interstate commerce and hence not subject to Taft-Hartley?

"We certainly would welcome it," Gray replied.

Taft then said he thought "we should explore the possibility" of exempting the construction of homes.

Despite Taft's wishes, there is little chance that he can get a majority of the Senate to go along on the exemption or, if he does, to get the House to agree on it.

Lockout charged in Idaho; end job closure in Wyoming

The building trades employers' stiffening resistance to wage demands was shown by two recent cases: In Wyoming a lockout by contractors was charged by the unions; and in Idaho a job closure was called off after one day.

The Cheyenne, Wyo., Building Trades Council accused the Cheyenne Associated Contractors last week of using a lockout in the current wage dispute with the building crafts unions.

The accusation was the latest development in a work stoppage in Cheyenne's building industry which began at the expiration of contracts on April 1. The unions are seeking a pay increase.

Meanwhile, the Associated Builders of Southern Idaho prepared a written contract proposal to building trades unions after calling off a job closure in the Boise area which lasted one day.

Charles Babbitt, chairman of the builders' labor committee, said the proposal, if accepted by the union negotiators, would serve as the basis for further contract discussions. Contractors closed down all jobs in the Boise area after unions threatened strikes because of failure to reach new contract agreements. The contract had expired on March 1.

"Down under" trade unions praise American contractor

A collective bargaining agreement concluded between a U. S. firm and representatives of 18 Australian trade unions was hailed by the latter as an example of the good points of collective bargaining and of the "enlightened" attitude of Braun Transworld Corp., which is constructing a big refinery for the Standard Vacuum Refining Co. near Melbourne, Australia. The new agreement covers about 1,200 employees and provides for liberal wage rates and a closed shop.

Other parts of the agreement halt strikes unless two working weeks of negotiations follow the decision to strike.

Wage rollback

The Tidewater chapter of the National Electrical Contractors Association proposes a wage rollback to the 1952 scale for electricians at Norfolk, Va.

The proposal was made to AFL electricians.

Principal reason for the request is the slowing-up of construction at this time, according to the contractors' group. Another reason given was the decline in the cost of living.

The union will present the proposal to its membership on May 5.

Strikes settled

Alabama strike is ended by new wage agreement as are strikes elsewhere

The five-day strike of 1,000 AFL building trades workers against the Associated General Contractors of Mobile, Ala., (ENR April 23, p.31) was settled April 14.

Settlement was effected under an agreement whereby workers will get an immediate 7½-cent hourly pay rise, and another 7½-cent hourly increase in fringe benefits on July 1; contract was extended through June 30, 1953.

Construction work in the area was shut down when the strike started. The union had asked for the increase because the Wage Stabilization Board —now inoperative—had disallowed part of a wage increase the unions got from the contractors.

• **Louisville, Ky.**—Some 600 AFL painters who struck when their contract with the Louisville painting contractors expired April 1 returned to work last week.

A settlement of 19 cents per hour wage increase was reached.

The strike had stopped painting at the Indiana Ordnance Works. The General Electric Co. appliance park at Bucchel, and an 80-building project at Fort Knox.

• **Partially settled**—Construction on an addition to the Westinghouse Electric Corp. plant in Sharon, Pa., was resumed recently when the Pittsburgh firm, which holds the contract, agreed to a $2.87½ hourly rate for carpenters.

Some eight other contractors signed the new wage agreement, but firms identified with the Shenango Valley Construction Council have not granted the 20-cent increase.

Baltimore strike ends as negotiations continue

About 2,200 construction workers in the Baltimore, Md., area returned to work last week ending a 17-day strike for higher wages (ENR April 23, p. 31).

The men returned without getting the higher wages they sought.

The 25 contractors, represented by the Baltimore chapter of the AGC, who had voted to "hold the line" on wages, declared themselves willing to reopen wage negotiations.

HANDSOME—AND QUIET—Like this administration and engineering building all other offices and shops at Arnold Engineering Development Center will be air-conditioned, to eliminate open windows that would let in test facilities' stupefying noise.

Power, water, noise add up to tough engineering at . . .

Supersonic test center

AFTER THREE SEASONS of slowly accelerating work, Army Engineers are beginning to see their way out of the Tennessee woods in their $170-million program to build Arnold Engineering Development Center, a U. S. Air Force project.

Early next year the first of the Air Force's three giant test units will be operative. Called the Engine Test Facility, this unit will be able to test full-scale turbojet and ramjet powerplants up to simulated altitudes of 80,000 ft. Temperatures as low as −120 deg F can be established. A ramjet addition to this unit, scheduled for later completion, will handle engines larger than any now in existence.

Next on the schedule is a gas dynamics facility, where hypersonic tests (greater than five times the speed of sound) will be made on developmental models of aircraft and guided missiles. The last of the present construction will be a Propulsion Wind Tunnel for full-scale operating tests, in the transonic and supersonic speed ranges, on aircraft and aircraft components. The first circuit, covering the transonic range, should be finished in 1955. Later the wind tunnel will have a second circuit, for supersonic tests.

• **Noisemakers**—These ambitious and unprecedented laboratories will make a lot of noise. Just how much, Air Force engineers aren't sure, but when they sought a site for the center they specified a distance of at least six miles from the nearest town. (They also deemed air conditioning essential for office buildings; open windows could let in enough noise to damage workers' eardrums.)

The nearest town of appreciable size is Tullahoma, Tenn., 12 miles west of the center and 80 miles northwest of Chattanooga, in an area where there is plenty of TVA power.

Electric power, too, was a site requirement. Motors for the Propulsion Wind Tunnel alone will deliver 216,000 hp. Two of these motors, each 83,000 hp, will be the biggest ever made. Eventually the center will have a peak demand of a half million horsepower.

Ample cooling water was the remaining big need for successful operation of the test facilities. If operated at the same time, the units under construction could take 265,000 gpm. But electric power now available will run at one time only enough of the facility to require 150,000 gpm—and the cooling-water system under construction can supply that much for four hours.

Eventually, peak demand capacity will reach 250,000 gpm, and it's to meet that goal that a reservoir on nearby Elk River was designed. Needless to say, the rainfall that fills TVA reservoirs is expected to keep the 280 sq mi Elk River watershed wet enough to satisfy cooling-water needs. The cooling-water story will be found in a separate section of this article.

• **Old Army camp**—The site chosen was de-activated 33,000-acre Camp Forrest, where troops from the Midwest trained for World War II.

The woods and swamps that served so well to condition men for overseas campaigns were hardly adapted to inexpensive heavy construction. So one of the first moves was to clear large construction areas and strip 300,000 cu yd of inferior foundation material—muck and the like—to depths as great as 7 ft. Then 1,000,000 cu yd of borrow, compacted with sheepsfoot rollers was placed to bring the grade out of the mud.

In that initial year (1950) there was mud, all right—compounded by the fact that it was one of the wettest years on record in southeast Tennessee. As late as June, 1951, when President Truman dedicated AEDC, so little apparent progress had been made that an aviation magazine estimated that the Air Force prediction of completion by 1955 was about two years on the optimistic side. But weather was good in 1951, and still

HUGH M. ARNOLD, Col., U. S. Corps of Engineers, has been with the District Engineer for the Tullahoma District since Congress appropriated funds for AEDC in 1950. A 1931 graduate of Alabama Polytechnic Institute, he worked for ten years with the Georgia State Highway Department and the U. S. Engineers. He went on active duty in 1941, taking on a series of war assignments in Trinidad, B.W.I., the Central Pacific Area and the Western Pacific Command. Postwar duties included the command of engineer research laboratories at Yuma, Ariz., and an assignment in the Office of the Chief of Engineers.

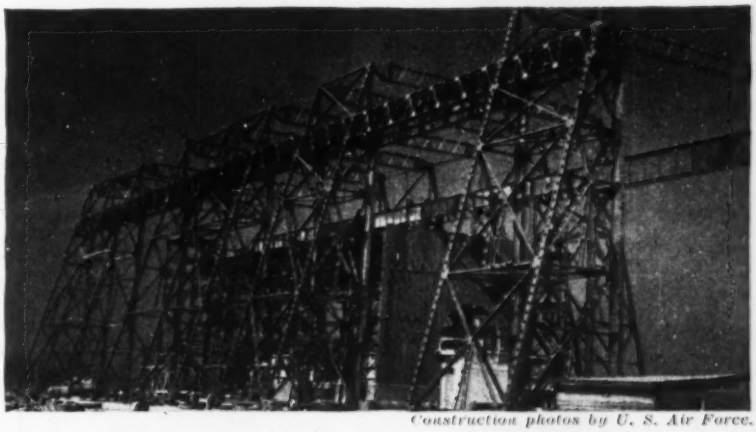
(He is not related to General "Hap" Arnold, who conceived the idea of the huge Air Force research center at Tullahoma, and after whom it is named.)

better in 1952. It now appears that the major contracts will be only a few months late.

• **Engineers, consultants, divide work**—On the job early were the Corps of Engineers, U. S. Army, Air Force engineers, and Sverdrup and Parcel, Inc., St. Louis consulting engineers. Sverdrup and Parcel made preliminary studies and undertook to design the so-called technical facilities—the machinery, tanks, ducts, conduits and many other items that made up a completed test installation. The Corps of Engineers organized the Tullahoma District to accomplish all construction and to design civil engineered structures, including the dam, buildings utilities and supporting facilities.

The first major contract, let in June, 1950, was for construction of Elk River Dam. Next, in September, 1950, a fee contract was let for the installation of equipment and piping in the Engine Test Facility. A $4.9-million lump-sum contract for ETF buildings was let a month later.

• **Engine Test Facility**—Housed in two steel-frame buildings having deep basements and mat foundations reminiscent of those of a power plant, the ETF has three test chambers that are to be served by the remainder of its equipment. About 12 ft in diameter, these chambers may be extended to lengths up to 90 ft. Four compressors will feed air to the test sections; six exhausters will evacuate the downstream side for altitude tests. Auxiliary equipment includes refrigeration and drying components and exhaust-gas coolers. Maximum power demand is 75,000 hp, which will increase to 150,000 hp when the ramjet addition is completed.



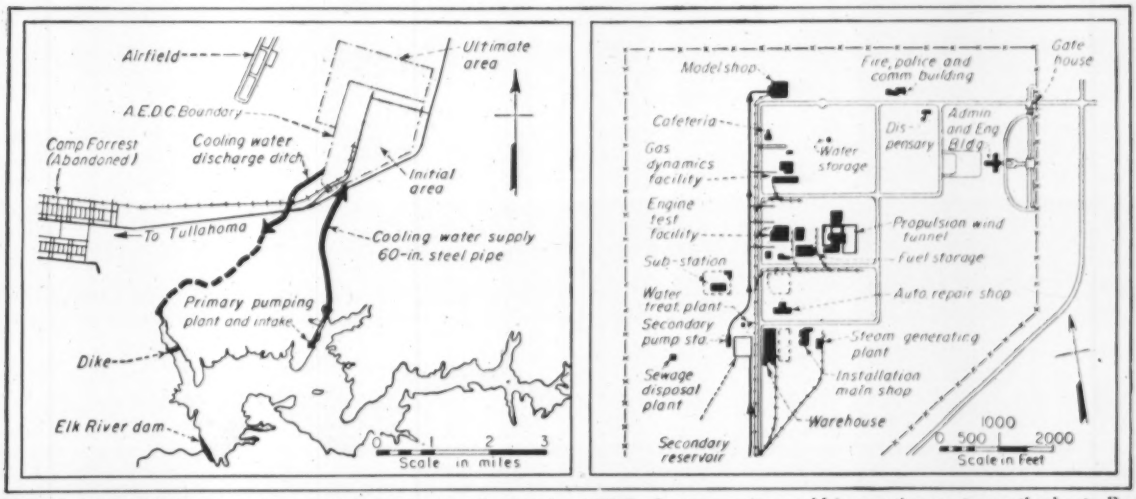
Construction photos by U. S. Air Force.

TRANSONIC LEG of propulsion wind tunnel will contain the heaviest piece of rotating equipment in the world—the rotor of its axial-flow turbine-like compressor. Huge craneway will handle compressor's installation and servicing.

• **Gas dynamics facility**—Three main buildings in the GDF (block area 700x800 ft) will house twelve centrifugal air compressors, driven by motors totaling 90,000 hp., as well as accompanying testing facilities. The compressors will be used in various combinations to feed air up to 2,500 psi at varying velocities, into two 40x40-in. test sections, located in a separate building.

Of special interest is an auxiliary component of GDF. To provide supersonic gas velocities for short periods in a 12x12-in. test section, this component consists of a 4,000-psi pressure tank on one side of the test section and a vacuum tank on the other. The vacuum tank, a welded steel sphere 72 ft. 6 in. in diameter, can be evacuated to nearly 0.1 psi absolute. Its plates are 1¼ in. thick. The pressure tank is a welded laminated pipe 736 ft long and 36 in. inside diameter, with walls 4.87 in. thick. When fully compressed the air in the tank weighs 50 tons.

• **Propulsion wind tunnel**—PWT, the third major unit at AEDC, is distinguished not only by the unprecedented power of its electric motors, but by the fact that the compressor rotor is to be the largest piece of rotating equipment in the world. It will weigh 240 tons. The compressor, a 200,000 cfs axial-flow machine similar in principle to a steam turbine, will be located in one leg of four-sided closed-circuit wind tunnels. The compressor has a diameter of 35 ft. It will be in line with the four electric motors (two 25,000-hp for starting; plus two 83,000-hp for full power), which will drive the compressor through a 36-in. shaft. The transonic circuit, now under construction, will yield test air velocities greater



RURAL LOCATION was an important factor in site selection for AEDC. In town noise would be a nuisance, to say the least. Reservoir (left) was first in order of business, because tremendous amounts of cooling water will be needed for tests. Layout of AEDC's main facilities area (right) shows secondary reservoir and cooling-water distribution.

than the speed of sound, in a 16-ft-square chamber 40 ft. long.

While PWT includes buildings of construction similar to the others, its distinguishing features today are the 55-ft dia. outdoor duct of the transonic wind circuit and a craneway for a 150 and a 75-ton crane that will handle the air compressor installation.

• **Foundation problems**—Concentrated loads from PWT elements and craneway columns, as well as other concentrated loads at the various building sites, are carried on steel H-piles driven to end bearing at depth as great as 70 ft. While the underlying stratum of limestone is considered free of caverns it has been found to have an undulating surface.

To counteract vibration from heavy machines many of the bearing piles were driven at a 2 on 1 batter. Further resistance to lateral displacement of structures is obtained by specifying that granular backfill next to building foundations is to be compacted to 95% of standard Proctor density. Engineers figure the lateral-resistance of this backfill to be up to 1,500 psf.

• **Labor situation**—Total labor force on the AEDC construction contracts is 1,450. Common laborers are residents of nearby places. Most of the skilled craftsmen come from Nashville and Chattanooga, but trowel tradesmen come from as far as Texas.

Labor relations have been fairly good, a total of 20 days having been lost by strike in almost three years. Jurisdiction was the principal cause. Meanwhile, wages have increased steadily, now being $1.30 for laborers, $2.375 for carpenters and $3.025 for bricklayers. While these rates are comparable with those at Oak Ridge and Savannah River atomic energy plants—the nearest big jobs—there has been some difficulty in holding men because there is little overtime.

• **Management**—Arnold Engineering Development Center is an activity of the U.S.A.F., Air Research and Development Command, Baltimore, Md. Under the command of Lt. Gen. E. E. Partridge, Air Installations Officers at AEDC have included Col. L. B. Woods, Col. P. F. Helmick, Col. J. M. Waddell, Air Force engineers review and approve design criteria, review and approve Corps of Engineer plans plus architect-engineer plans and make "command inspections" when a construction element is ready for acceptance. Under Colonel Hugh M. Arnold, Tullahoma district engineer, is Lt. Col. W. A. Darden, executive officer. Galen Wallace, chief engineering division; E. C. Little, chief construction division; Lynn T. Webb, chief administrative division.

Problems of a giant cooling system

Tremendous horsepower, in action at Arnold Engineering Development Center, will require equally impressive amounts of cooling water. If all of the center's test units were to run full-blast at the same time, 265,000 gpm would be needed. But there won't be enough electricity available at first, so test operations will have to be staggered—and the heaviest water demand at any time will be 150,000 gpm.

Schedules will be adjusted further so that the job can be done with only 100,000 gpm from Elk River reservoir. This sounds like a neat trick, but with a secondary reservoir and pumping plant it's feasible, at least for a four-hour period.

In use, cooling water goes through the following cycle:

1. It is pumped at 100,000 gpm max. from the reservoir to the center, through a 60-in. steel pipe.
2. It is retained in a 13-mg secondary reservoir.
3. It is pumped at 150,000 gpm max. to the test facilities, through a distribution system.
4. It is collected in a return system and discharged to a creek, which empties back into Elk River reservoir.

In connection with this circulation cycle, two problems have occurred to the engineers. The first is water temperature when it returns to the reservoir. It will come from test facilities

Major construction contracts at Tullahoma

Contractor	Facility	Award date	Amount Million $
Arundel Corp. and L. E. Dixon Co., Tullahoma	Elk River Dam	6-23-50	3.3
Blount Bros. Const. Co., Montgomery, Ala.	Motor bldg. and craneway, PWT; found. piles, GDF and PWT.	10-24-51	1.0
Consolidated Western Steel Div., U.S.S., Los Angeles, Calif.	Gas Dynamics Facil.; Ramjet Addn. to ETF	2-29-52	25.0
Fluor Corp., New York	Ducting for ETF	7-17-50	3.2
Hardaway Contg. Co., Columbus, Ga.	Streets, roads and utilities	2-23-51	5.6
Maxey, Robt. E. Const. Co., Lubbock, Texas	Admin. bldg.	2-6-51	3.0
	Model shop and lab. annex	6-19-51	1.8
Patti - Massman - MacDonald Const. Co., Kansas City, Mo.	ETF buildings	10-20-50	4.9
Rust Engg. Co., Birmingham, Ala.	Install eqpt. and piping, ETF	9-22-50	5.5
Stacey Bros., Atlanta	Air cooling, PWT	3-20-51	2.8
Tompkins, Chas. H. & Co., Washington, D. C.	Intake and prim. pump. sta. for cooling water	3-27-51	1.1
	Secondary pump. plt., reserv., sanit	5-12-51	1.6
Westinghouse Elect. Corp., Pittsburgh	Compressors and motor, PWT	10-3-50	18.0

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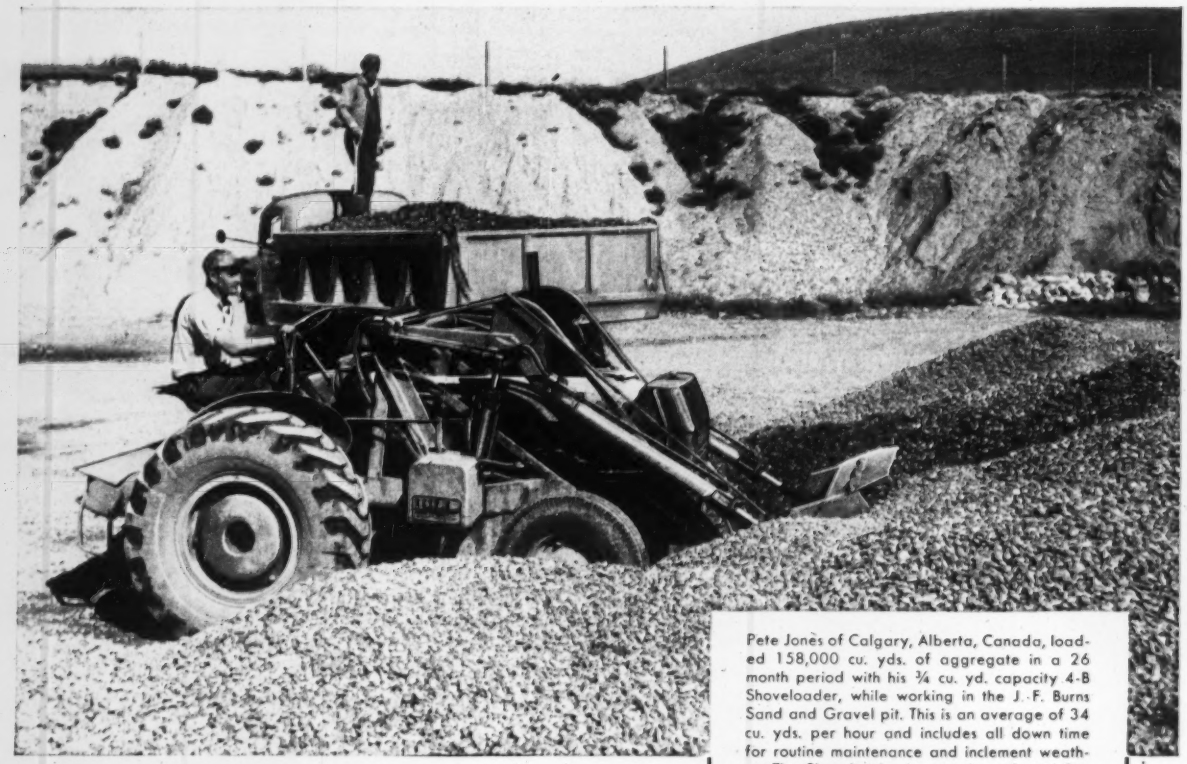

Pete Jones of Calgary, Alberta, Canada, loaded 158,000 cu. yds. of aggregate in a 26 month period with his ¾ cu. yd. capacity 4-B Shoveloader, while working in the J.-F. Burns Sand and Gravel pit. This is an average of 34 cu. yds. per hour and includes all down time for routine maintenance and inclement weather. The Shoveloader is now down for its first major overhaul and still has the original set of tires. Frequent timing of the operator showed he could load a 6 cu. yd. truck box in 4½ minutes. Mr. Jones considers his Shoveloader the most efficient machine for his jobs and has now purchased another unit.

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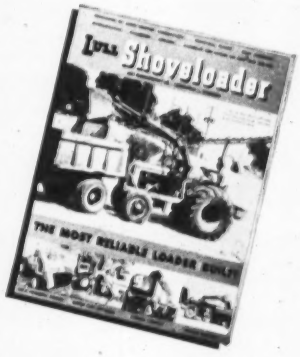

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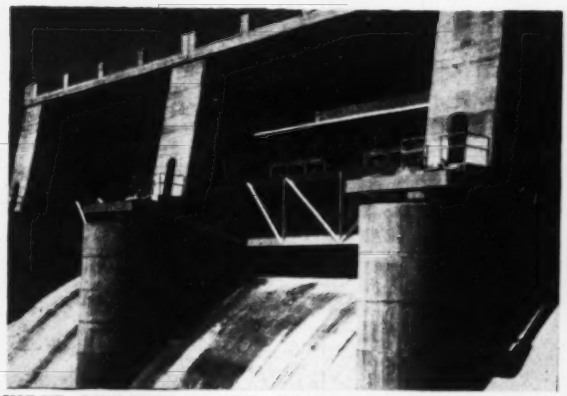
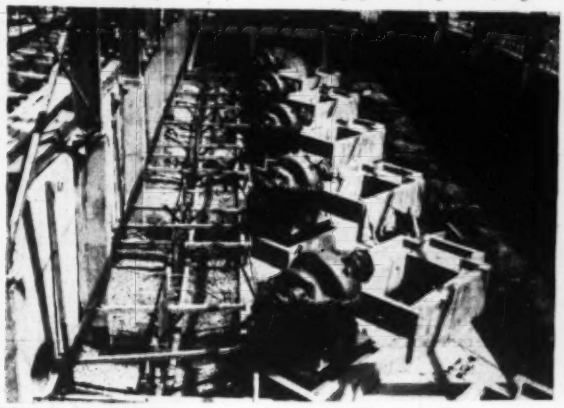
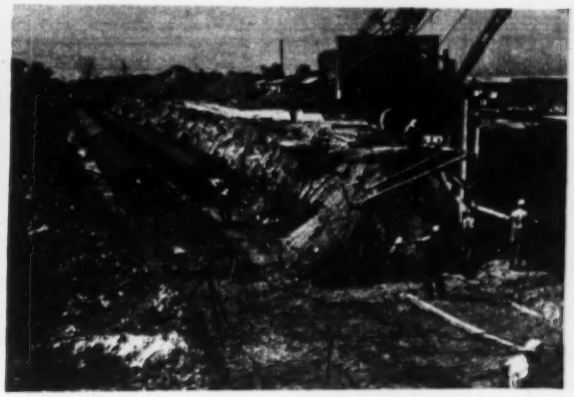


FIRST, GET THE WATER—Elk River Dam impounds 80,000 acre-ft at normal pool. Note "skimming gate" atop tainter gate.

THEN PUMP THE WATER—Four 25,000-mgd pumps in primary station at reservoir move water 4 miles; raise it 150 ft.



PUMP IT AGAIN—Pumphouse alongside secondary reservoir contains six 25,000-gpm pumps, three smaller ones.



DISTRIBUTE IT—These pipes will feed test facilities (left, 74 in.) and take their cooling-water return (right, 84 in. dia.)

at 150 deg, but, on its route back to the reservoir it is expected to cool enough so that reservoir temperature rise will not exceed one degree during a test. The second is the likelihood that oils picked up during the cooling process would pollute the reservoir.

• **Oil capture**—To provide retention for cooling, and to keep oils from polluting the reservoir, engineers built a dike across the cooling-water-discharge arm of the reservoir. This dike contains a culvert with its arch 5 ft below normal reservoir level. Oils will rise to the surface of the pool (120 acres) while water will flow through the submerged culvert into the main reservoir. Oils will be burned periodically.

Elk River Dam is a concrete gravity and earthfill type, 90 ft max. high and almost 3,000 ft long. It impounds a 3,980-acre reservoir at normal pool, when storage is 80,000 acre ft. While flood control is not a primary function this factor will be taken into account in dam operation.

The primary pumping plant alongside the reservoir has two intake structures, one for the present installation and one for future expansion. Two gates 10x10 ft square have their sills at 39 ft below normal pool and at 20 ft below normal pool. During periods of high runoff the upper gate is to be used, to obtain water of low turbidity. In the summer, when runoff is slight and turbidity is no problem, the lower gate will be used to get the coolest water.

Four vertical-type well pumps, each 2,000-hp and 25,000-gpm, will lift water to the center against an equivalent head of 265 ft. Actual difference in elevation between the reservoir and the secondary reservoir is about 150 ft. The 60-in. pipeline is 4 miles long, all uphill. This meant cuts as deep as 22 ft, but it was cheaper than providing air bleed-off and drainage at high and low points. Pipe wall thickness is ⅜ in., and joints are connected alternately with welding and couplings.

The earthfill secondary reservoir is trapezoidal in cross-section, being 155 ft square at the bottom, 315 ft square at the top and 32 ft deep. Bottom and sides are paved with gunite 2½ in thick and the structure is roofed, to prevent casual pollution and algae formation. (Water is heavily chlorinated at the main reservoir intake, to prevent algae formation in the pipeline.)

Alongside the secondary reservoir is the secondary pumping station, which consists of six horizontal pumps rated at 25,000 gpm against 225 ft total head. Motors are 1,750 hp. There also are three 2,000-gpm pumps to keep pressure in distribution lines during light demand. The distribution main is 84 in. dia, feeding to lesser pipes to the test facilities.

Discharge pipes up to 90 in. in dia. lead to an outfall into a 2.2-mile ditch, thence to 3.2 miles of creek, in which the fall is 100 ft before the oil-separation pool is reached.

• **Progress**—The central or supporting facilities of AEDC are virtually complete. Included in these are the administration and engineering building, shipping and receiving warehouse, installations maintenance shop, fire, police and communications building, steam generating plant, water treatment plant, sewage disposal plant, dispensary, cafeteria, model shop and laboratory annex, power control building, primary pumping plant, secondary pumping plant and reservoir, the Elk River water supply dam and reservoir, as well as railroads, roads, streets and all utilities.

RIVERSIDE SITE for power plant addition was a treacherous place for piledriving and excavating equipment until electro-osmosis came to the rescue.

Electricity dries wet silt

ELECTRIC CURRENT has cracked one of construction's toughest dewatering problems.

On a power plant job near Bay City, Mich., foundation excavation had to go down into silt. When it is wet—and this was wet—silt is highly unstable. Reduce the moisture content by only a small percentage and you have a material that will stand up straight and carry a decent load.

The difficulty lies in reducing moisture even a little; capillarity between the particles resists the efforts of straight wellpoint pumping. Add a high vacuum capacity to the wellpoint system and you come closer to the answer (ENR April 9, p. 33), but it's expensive, because of the extra power that is required for vacuum pumping, and because points must be close together.

Now, at Bay City, foundation construction is proceeding nicely, thanks to a principle discovered almost 150 years ago. Known as electro-osmosis, this effective method for dewatering silt makes use of electrodes driven into the material to be dried. An ordinary steel pipe or rod is the anode; a wellpoint is the cathode. Direct current, made by portable motor-generator sets, flows from the rod, pulling capillary water along and delivering it to the wellpoint, where pumps raise it to header and discharge. As a matter of fact, if you leave the wellpoint open at its top, water will flow out of it anyway, as long as there is current from the anode to the cathode.

• **How it works**—Leo Casagrande, who holds patents on features of the method, explained it in a paper presented before the Boston Society of Civil Engineers on Jan. 10, 1951. That discussion is confined to fine-grained soils, where pore size is microscopic and water movement is by capillary action.

Casagrande begins his account by going back to 1807, when a man named Reuss discovered that if an electric potential is applied to a porous diaphragm, the water moves through the capillaries toward the cathode; the water flow stops when the current is turned off.

In 1879, Helmholtz explained the phenomenon: In a cylindrical capillary tube filled with water it is necessary first to distinguish between the free water and a boundary film of water adjacent to the capillary wall. Helmholtz called this film a "double layer" because he assumed the existence of opposite electric charges on two layers forming the double layer.

One part of the double layer, thin in comparison with total thickness of the double layer, and which carries the negative charges, is rigidly attached to the wall. The thicker part of the double layer, carrying the positive charges, is movable.

When an electric potential is applied to the capillary, the positive charges move toward the negative pole, dragging the water molecules of the double layer along with them. In turn, the cylinder of free water, completely surrounded by the double layer, also is dragged along. This phenomenon is known as electro-osmotic flow.

If the cathode will admit water—as a wellpoint will—the water will be forced into the pipe and up to the open top, with pressures as high as 6,000 psi.

As the capillaries are relieved of water they shrink, and thus the ground consolidates and becomes stable. At Bay City, as an experiment, one cathode wellpoint was extended 20 ft above ground; water continued to flow at an undiminished rate.

• **Bay City situation**—Electro-osmosis, applied successfully in Europe in recent years and considered for at least one earlier job in the United States, finally got its chance to do a big U.S. assignment when contractors ran into difficulty on the Bay City power plant. (The Port of New York Authority set up a small electro-osmosis test section while preparing for a diking job around LaGuardia Airport in 1949; sand drains were chosen instead, partly because the authority deemed its electro-osmosis test insufficient in scope. ENR Dec. 15, 1949.)

The project was a two-unit addition to John C. Weadock generating plant of the Consumers Power Co. at Essexville, near Bay City and right at the edge of the Saginaw River. The reason there had been no difficulty in previous construction was that excavation went only to the bottom of a sand forma-

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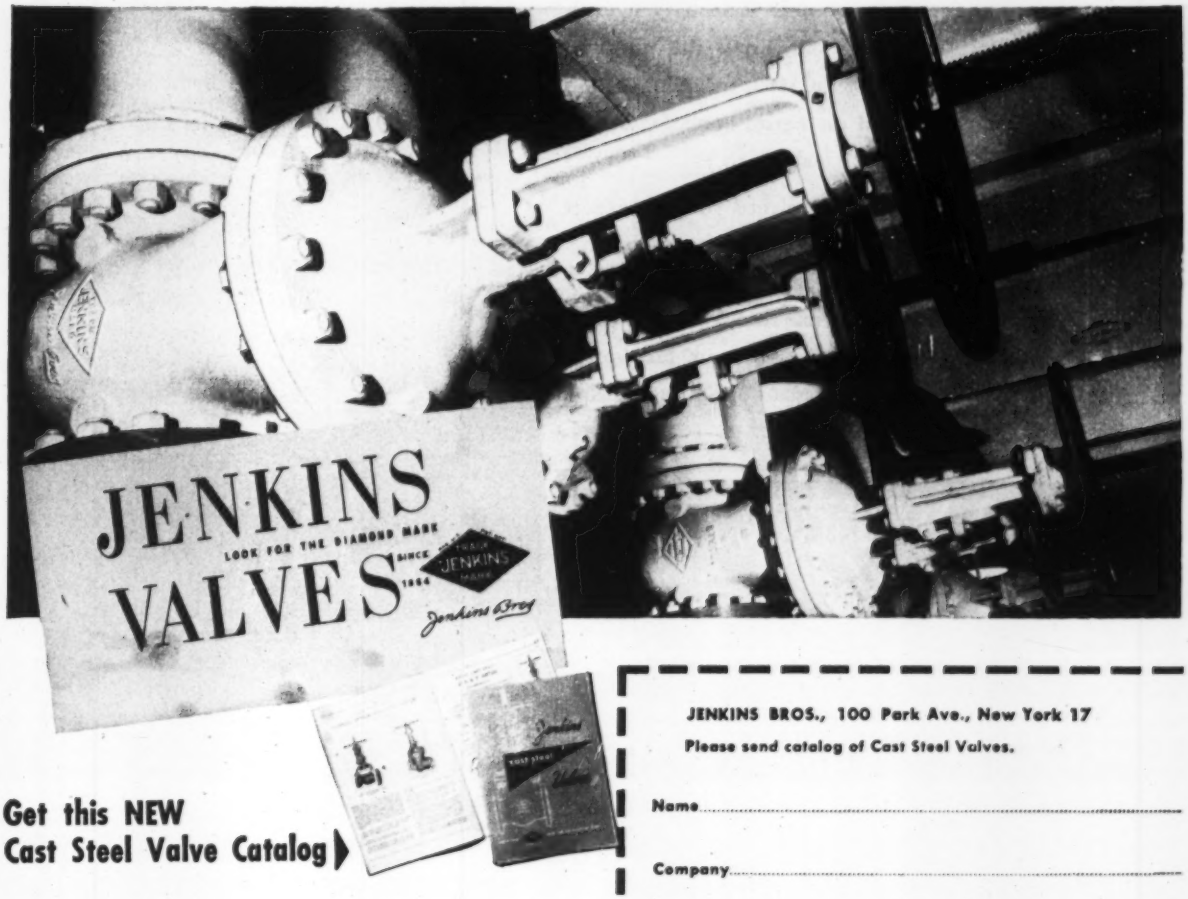

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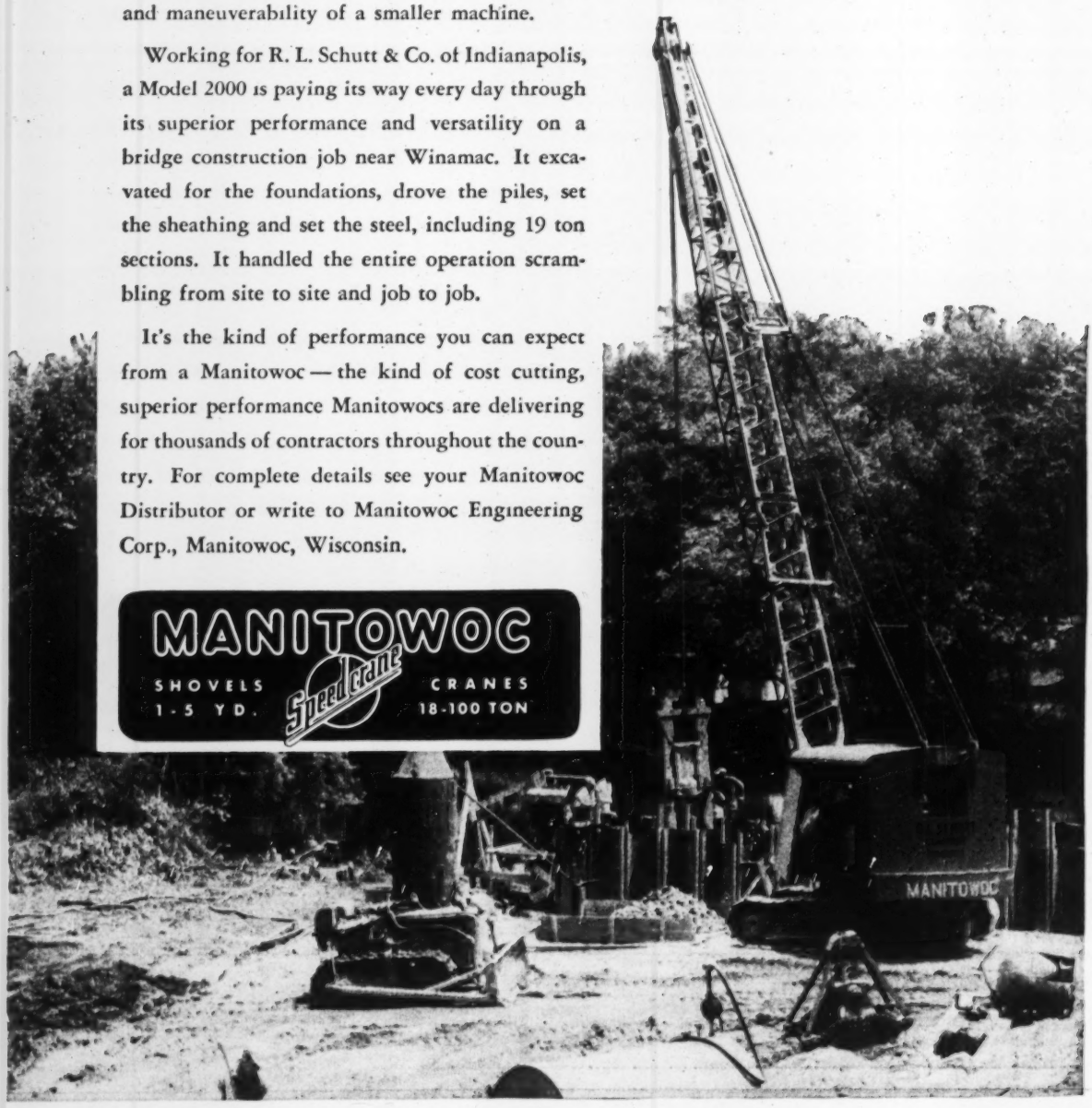
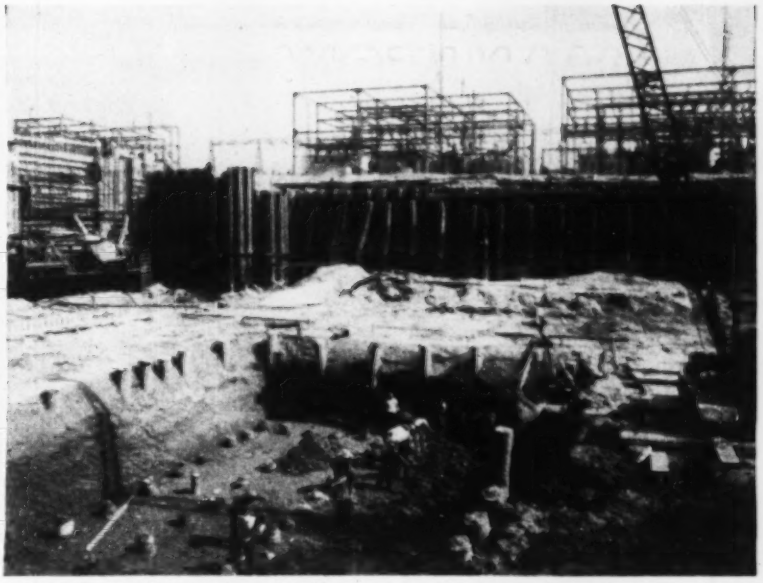


ELECTRICAL CONNECTION to wellpoint pipe makes it a cathode in direct-current circuit.



STABILIZED SILT stood vertically without bracing or sheeting. This is trench for condensing-water intake, which has a subgrade level almost 20 ft below top of silt stratum that was dewatered electrically.

tion. Below this is the saturated silt. Because new generating units are to be 135,000 kw—more than twice the size of the older 60,000-kw units—their pile-supported foundation mat has to go nine feet deeper. Moreover a cooling-water intake tunnel must go another ten feet down.

The plot is 210 x 280 ft in plan. Herlihy-Mid Continent Co., of Chicago, surrounded the site with sheetpiles, then dewatered the sand layer with a ring of wellpoints. The plan was to put a second ring of wellpoints at bottom of sand when sand excavation was complete, then proceed with silt excavation. Wellpoints would relieve uplift from an underlying pervious stratum, and, with the aid of high vacuum, wellpoints would dewater the silt.

But as soon as second-stage wellpoints were in place and excavation in silt began, sheetpiles began to move in. Herlihy hastily backfilled. Meanwhile, the wellpoint subcontractor, Wellpoint Dewatering Co., of New York, had completed arrangements with Casagrande for the use of electro-osmosis.

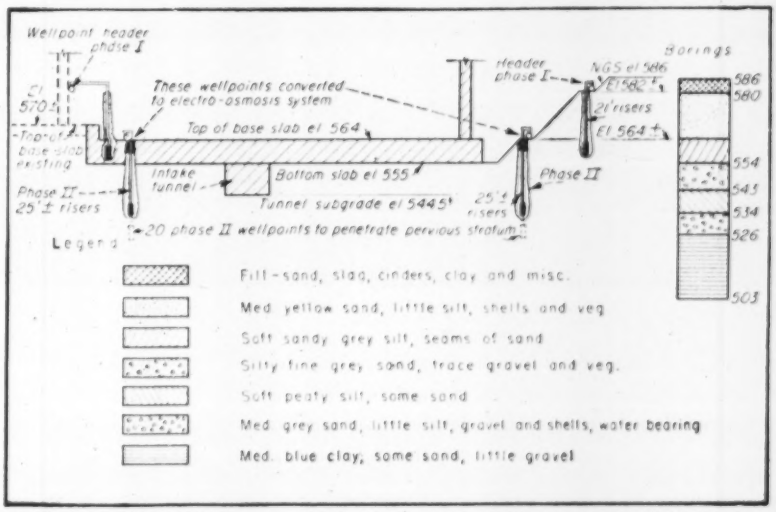
Second-stage wellpoints were converted into an electro-osmosis system by using wellpoints 20 ft apart as cathodes. In between, plain pipes were driven to act as anodes. A battery of motor-generator sets was hooked into the system to furnish dc current at 80v and relatively low amperage. Although the electro-osmosis process will force water to the surface through open wellpoints, header and pumps were used at first to aid in water disposal and to reduce the voltage otherwise required.

The effect was remarkable. In 3 or 4 days the quaking, saturated silt began to solidify into a stiff sandy-clay formation that would support pile-drivers and excavation equipment. Excavation progressed to slab grade, then the intake water trench was cut without any sheeting or bracing. Clay spades were used to trim these low walls, while clamshells removed the muck.

The trench is in the middle of the site, and the current flows from anodes to all cathodes, in varying degrees of intensity, probably the way magnetic lines of flux bulge out on both sides of straight lines between anodes and cathodes. Drying-out action was highest near the cathodes.

Electrolytic action on the anodes is pronounced. On this job, many of the pipes had to be built up by driving rods down their centers.

• **Cost favorable**—According to officials of Wellpoint Dewatering Co., the cost of electro-osmosis dewatering is comparable with that of straight wellpoint work. Richard Loughney and Ray Bratton, superintendent, were in charge of the work for Wellpoint Dewatering Co. Robert J. Zimmerman is superintendent for Herlihy-Mid Continent on the power plant addition, where foundation concrete construction now is progressing, with no more worries about wet silt.



ELECTRO-OSMOSIS system utilized the lower stage of two-stage wellpoint setup. Cross-section shows nature of ground and position of structures for generating units.

ROADBUILDING TEAM: Trencher excavates clay subsoil, mixing it with surface layer of blow sand. Motor grader fills trench with sand then blades and compacts the stabilized road surface to proper width and crown—using the windrowed sand and clay.

Trencher builds low-cost road in Texas

IT TOOK AN OBSERVANT county road commissioner in western Texas and an oil pipeline crew to come up with a unique method of low-cost road construction that may spread fast in that sandy, arid country. Although it is no panacea for all county road deficiencies, the system offers a simplified and economical method of building serviceable, stabilized sand-clay roads.

• **Trencher and grader**—Only two types of equipment are needed: a trenching machine and a motor grader. The method is applicable only where existing sandy roads are underlain with a clay subsoil. The trencher excavates and mixes the clay and sand, while the grader spreads the material over the roadway, and compacts it.

Credit for developing this method of roadbuilding belongs to J. F. Bodine, road commissioner in Mitchell County, near Colorado City, Tex.

• **Troublesome old roads**—In their natural state, many of these roads are composed of wind-blown dune sand, overlying a stratum of heavy clay. Strong winds and shifting sand have built up a line of dunes along the fence rows. Wind erosion, aggravated by maintenance work with motor graders, has eroded the roadway below the level of adjoining fields.

During dry weather the roads become deeply rutted and form sand bogs. During infrequent spells of wet weather they form sandy mires since the water can't readily drain away. And during windy weather they become clogged with small drifts of blow sand.

• **Makeshift maintenance**—In the past, maintenance work consisted of filling the ruts and blading the deposits of blow sand to one side. But this gave only temporary relief, at best. As more loose sand was bladed to the sides of the road, there was an increased tendency to form new sand drifts.

During his long trips to town as a farmer, Bodine had noted that wherever pipelines crossed beneath a road the surface was relatively compact—not deep sand as it was everywhere

WIND-SWEPT COUNTY ROADS in western Texas, rutted and choked with shifting blow sand, are raised, rebuilt and stabilized with sand and trench-excavated clay, by a new method

How Are Natural Rubber Roads Standing Up?

A Progress Report

Since 1949, test roads incorporating natural rubber powder have been laid in 19 states in the U. S. Most of them are in excellent condition today and have required no maintenance. While it is still too early to say conclusively that natural rubber roads are the answer to America's tremendous highway problem, indications are that natural rubber powder added to asphalt can aid materially in stretching our highway dollars, by giving us roads that last longer and require less repair.

West Side Highway, **Borough of Manhattan, New York City** Laid, summer 1950, a 100′ test section of natural rubber-asphalt pavement, with adjacent stretches of other types of rubber paving and a control section without rubber.

RESULTS: *After almost three years of traffic, rated at 60,000 vehicles per day, the natural rubber section has withstood the ravages of traffic and climate, and the Borough officials are well pleased with the results.*

Falls Road, **Baltimore, Maryland**

Laid, 1950, a test section with 1¼" binder course and 1" sheet asphalt top course, both containing natural rubber powder.

RESULTS: *After nearly three years of main artery traffic, both the natural rubber section and the control section are in first-class condition. The natural rubber section appears darker in color, indicating it has not lost as much of the lighter oil fractions of the asphalt cement through solar radiation.*

Route 11, **Montreal, Canada**

Laid, 1949. Control section (without rubber) was laid twice the thickness of the natural rubber test section. Traffic volume is up to 25,000 vehicles per day, with vehicles using tire chains during most of the winter.

RESULTS: *On the control section, chain markings appear to be permanent, and the surface has broken through in several spots. On the natural rubber section, chain indentations, which appear during the winter, are healed over and smoothed out during summer months, leaving no apparent damage to the surface.*

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else. As a road commissioner he wondered just why these spots were better than the rest of the road.

• **An idea is born**—Bodine got his answer by visiting a nearby pipeline construction job. The trenching machine in excavating about 5 ft deep for the pipeline, cut through the sandy topsoil into the heavy clay subsoil, bringing up both and mixing them thoroughly. The result was a large quantity of about equal parts of sand and clay—a good roadbuilding material that wouldn't blow away when dry or become muddy when wet.

Bodine next rented a trenching machine from a local contractor. With it and a motor grader, he rebuilt a stretch of old road. The results were so good that the commissioner was authorized by the county board to buy a trenching machine, costing about $12,000, to be used exclusively for roadbuilding. It was delivered last November.

During the first three months, Bodine's crew rebuilt 9 miles of county roads, and he plans to rebuild a total of 40 miles this year. His equipment consists of one trencher and two power graders, and his crew is made up of three operators and three laborers.

• **How it works**—Here is how the work is done: Existing roadside fences are removed and stockpiled for re-erection after the road is completed. The sand dunes formed along each fence row are bladed toward the center of the road, building it up to about the level of the adjacent fields.

The trencher then goes to work digging a 27-in. wide ditch to a maximum depth of 5 ft 4 in. It is located 12-ft from the center line of the road.

Experience has shown that the best stabilized road is obtained with about equal parts of sand and clay. Borings made ahead of the trencher measure the depth of sand. Where this depth exceeds 2 ft 6 in., a grader removes the sand down to within 2½-ft of the clay subsoil, ahead of the trencher. Where the sand is less than 2½-ft, the cutting wheel of the trencher is raised accordingly to give a 50-50 mixture of sand and clay.

The excavated material is discharged toward the center line of the road. After completing a length of ditch along one side of the road, the trencher turns around and digs a second ditch along the other side of the road. This leaves a sand-clay mixture where the graders can spread and compact it to form the 24-ft wide roadway surface.

• **Raise roadway crown**—Material from the trencher raises the crown of the new roadway from 24 to 36 in. above its original elevation. If additional material is needed, a third or even a fourth trench is made.

The graders follow close behind the trencher, filling the ditch with sand and compacting it with their tires.

No sprinkling or rolling is needed in rebuilding the roads. Water is at a premium and the new sand-clay road surface can be sufficiently compacted during grading operations and later under traffic. Final operations include cutting shallow drainage ditches along each side of the roadway, and replacing the fences where necessary. Where possible, the fences are not rebuilt, since they tend to start the formation of new sand dunes.

• **Economy, not speed**—No great efforts are made to speed up the work, since economy of construction is of paramount importance. Under average conditions Bodine's 6-man crew easily builds a mile of road per week. Time-records on a one-mile section showed that it took the trencher only 21.5 hours to dig a trench along each side, and 9 hours for the two graders to complete the work.

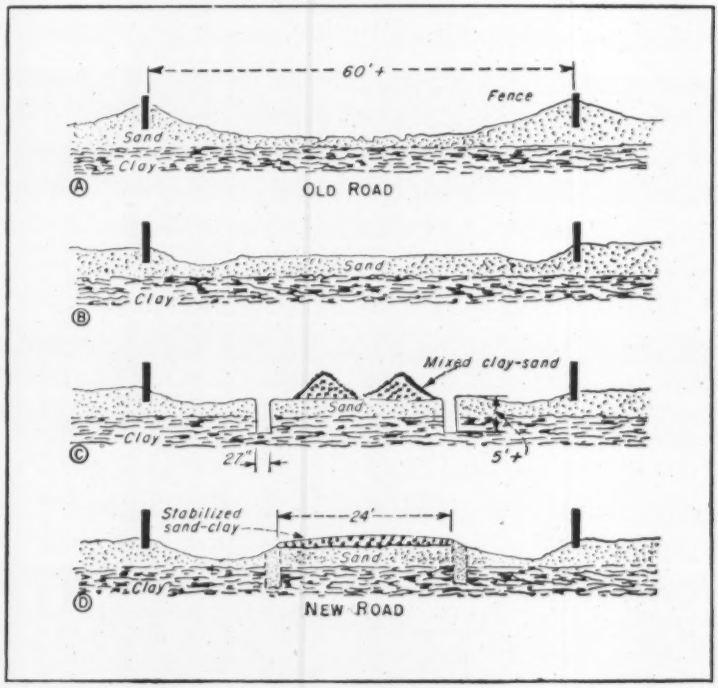
The cost of rebuilding these old county roads varies considerably, but the average cost is estimated to be in the neighborhood of $700 per mile. The maintenance budget of Precinct No. 1 is only $3,000 per month. Out of this they plan on rebuilding three miles of road per month and maintaining their entire 280-mile network of roads.

Time, wind, weather and traffic will measure the effectiveness of Bodine's roadbuilding program. It appears, however, to offer a low-cost solution for stabilized clay-sand roads, where both materials exist as they do in Mitchell Co., Texas.

The low cost of construction is due, in part, to the fact that the sand-clay roadbuilding material is moved only a few feet. The excavated trenches provide convenient places for disposing the accumulation of blow sand along the sides of the road. And the trenching machine performs its duties without a single alteration.

• **Credits**—Photographs of the work and data for this article were furnished by INTERNATIONAL HARVESTER CO., CHICAGO, AND BROWNING-FERRIS MACHINERY CO., EQUIPMENT DISTRIBUTORS, DALLAS, TEXAS.

The cause and the cure . . . in three stages



SHIFTING SANDS have caused the formation of dunes along the fence rows, while roadways have become progressively more rutted (A). The cure is made by first raising the roadbed by blading the excess dune sand to the center of the road (B); sand and clay subsoil are excavated by trencher and windrowed (C); then motor grader fills trenches with sand, blades and compacts the stabilized sand-clay roadway, and cuts the side ditches for drainage.

MEADOWBROOK shopping center, near Cleveland, Ohio, will be one of country's largest when completed.

Shopping centers continue boom

San Francisco will get $25-million project; new development in Cleveland heads Ohio construction

Shopping centers are continuing the trend toward supplying an increasing share of construction business. Recent announcements of a $25-million center for the San Francisco area and an over $15-million center near Cleveland—part of a $100 million worth of shopping center construction in the northern Ohio area—emphasize the trend toward larger and larger projects for future developments.

• **Split-level design**—The West Coast center will feature a "split-level" design. Stores will be built on two levels, each to have its own parking area.

On the lower level, stores will face a shopping court. Upper level shops will have two frontages—one on a parking area and the other facing a balcony sidewalk which encircles the shopping court (see cut).

Covered ramps will enable the shoppers to go from store to store without being exposed to the weather. Trucks will deliver stock to the stores through underground tunnels.

The 48-acre center, to be called "Bay-Fair," will be located between San Leandro and Hayward, Calif. It will serve the southern portion of the East Bay area. Specific location is the site of the Oakland Speedway Stadium.

Plans call for 100 shops with free parking facilities for more than 12,000 cars.

• **Big department store**—Macy's San Francisco—large department store—will keynote the bigger stores, and will be located in a separate $6-million building.

Preliminary plans were drawn by architect Victor Gruen, who has also been retained to work up final plans. Construction is expected to start in the late summer of 1954. The first tenants would move in some time late in 1955.

Joint sponsors of the project are the Capital Co., real estate subsidiary of the Transamerica Corp.; Beckett & Frederighi, East Bay land developers, and Macy's San Francisco.

• **Cleveland plans**—Also in the future is the big new center for the Cleveland area—the Meadowbrook Regional Center in suburban Bedford.

G. J. Goudreau & Co., Cleveland builder, is carrying out the center as part of a community development project.

If built as now planned, the shopping center would cost about $15 million and that "probably would be a minimum estimate," said a Goudreau spokesman.

The center will cover about 80 acres. Two big department stores and some 80 other shops will utilize 500,000 sq ft of selling space.

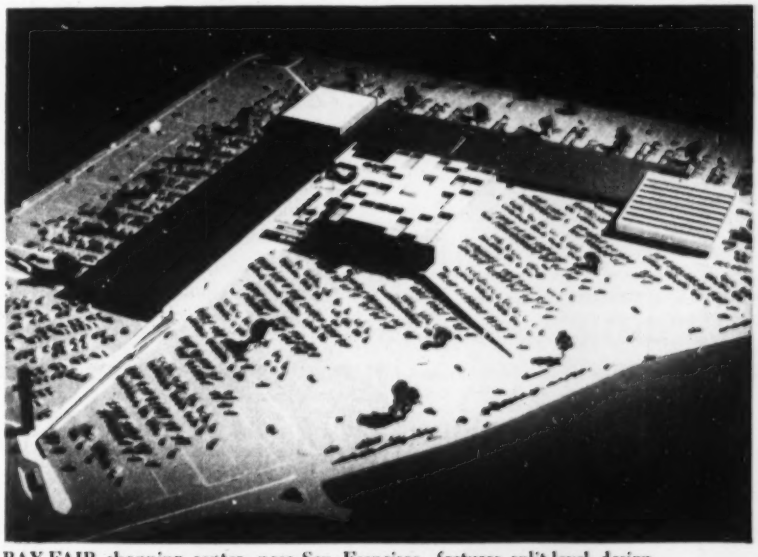
Parking will be provided for 8,000 cars.

While construction details have not "firmed," architect G. S. Voinovich indicates that considerable use will be made of glass—particularly corrugated glass—as a construction material in an effort to achieve maximum attractiveness at lowered costs.

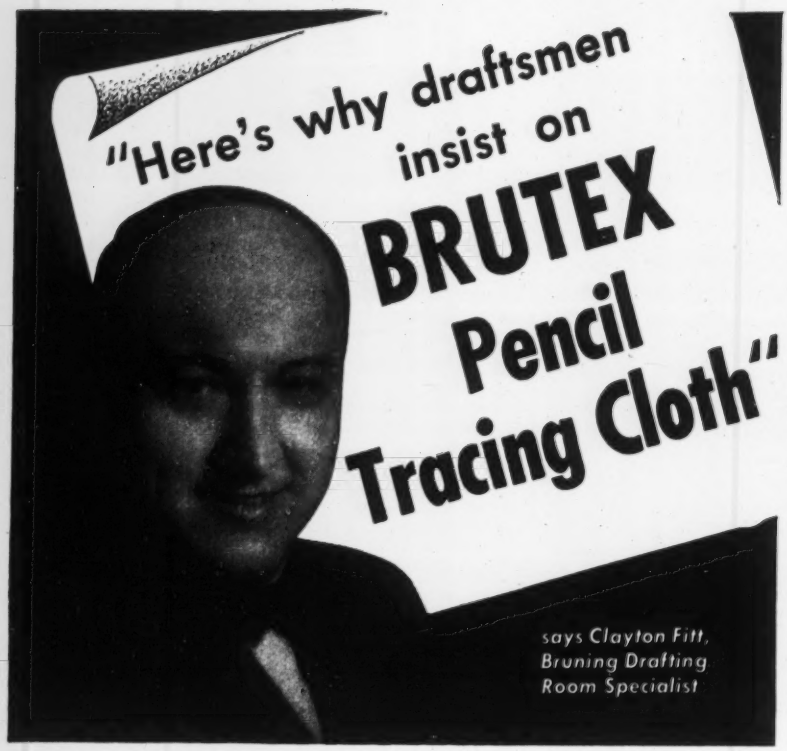
A 1955 completion goal is scheduled. No starting date has been set.

Elsewhere in northern Ohio, an $8-million project is scheduled to get under way this month in Toledo. First step is a $3-million section housing some 30 stores.

The second section—to include a hotel—will get under way some time toward the end of 1953 or the beginning



BAY-FAIR shopping center, near San Francisco, features split-level design.



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of 1954. Location is the Anthony Wayne Trail and Detroit Avenue.

• **Ohio breakdown**—The $100-million shopping center construction figure for the northern Ohio area breaks down this way: The northeast section, $58.4 million; the Toledo area, more than $18 million; scattered through Lorain County, $13 million; in or near Akron, $12 million; in Marion, $3 million, plus a number of smaller projects in the rural areas.

Detroit resolution hits contractor bid-shopping

Contractor bid-shopping was the target of Detroit's Common Council when it recently approved a measure providing that contractors who do business with the city must include names of subcontractors when submitting their bids.

The new resolution, which applies to contracts involving $100,000 or more, also requires that any change of subcontractors must have the city's approval.

Design work starts on New Orleans tunnel

Surveys, borings and design work have begun on a $5.5-million vehicular tunnel under the Intracoastal Canal west of New Orleans. Contract for design was awarded to Palmer and Baker, Inc., New Orleans.

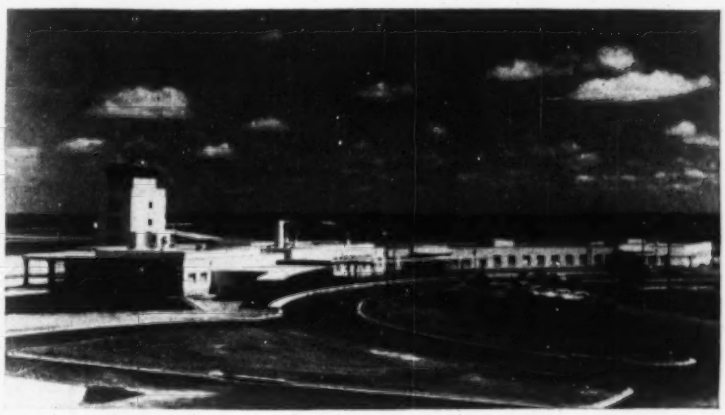
June 1 has been set as a target date for advertising for bids on tunnel construction. The four-lane toll-free tunnel, 1,850 ft long, will have a steel and concrete box section. Two walkways will be provided for pedestrians. The tunnel will be ventilated, automatically eliminating continuous supervision.

Now,, about that loan . . .

Suit has been filed by the federal government at Indianapolis in behalf of the Public Housing Authority, seeking to recover $227,000 previously lent for low cost public housing.

The program met strong opposition from real estate and building organizations so the city council barred construction of the units. But the Indianapolis Public Housing Authority went ahead buying property and drawing plans anyway.

The federal government said all but $23,000 of the original $250,000 loan has been spent.



San Antonio gets new airport building

San Antonio, Tex., recently dedicated a new airport terminal building featuring a built-in endless belt baggage conveyor. Luggage is carried several hundred feet from the airport apron, under the terminal building, to the taxicab and passenger loading platform.

The new building houses the control tower, offices (including one for the city's director of aviation), lounge, restaurant and a nursery. Total cost was $1.3 million.

State buildings go to Baltimore

Project to be part of city's slum clearance; Court upholds state's redevelopment law

The state of Maryland is going to build a $10-million group of office buildings in Baltimore on a site the city has selected for a slum clearance project.

Out of a total of 27 acres, the state buildings will occupy about 16 acres. The remainder of the area probably will be developed for commercial use.

Boundaries of the area are Howard, Dolphin, McCulloh and Biddle Streets. The section is on the edge of Baltimore's downtown business district, near the B&O RR Mount Royal station.

• **Financing uncertain**—There is still a question of how the project is going to be financed. Baltimore's Redevelopment Commission intends to make application for federal aid for clearing the land but if this doesn't go through, Gov. McKeldin indicated that the state would go ahead anyway.

Backing up his talk is $10 million available from a state bond issue.

Architects for the job are Fisher, Williams, Nes and Campbell with the L. P. Koken Co. serving as engineers.

• **Law upheld**—In a court action on another Baltimore slum clearance project, the Superior Court upheld the validity of a Maryland constitutional amendment authorizing the city to condemn property for development by a private corporation.

At stake was the so-called Broadway area project near Dallas and McElderry Streets.

The action was brought by an owner of property in the section who contended that the city was taking private property for private use.

As in the Ohio redevelopment case (ENR, Mar. 12, p. 55), the court held that taking of land for slum clearance is for public use and that the constitutional amendment is therefore legal.

The case is expected to be taken to the Court of Appeals.

Highway waits for bridge

A proposed $5-million highway through Covington and Kenton County—both in Kentucky—probably will be abandoned unless a new bridge over the Ohio River to Cincinnati is included. The present two-lane bridge was deemed inadequate to take care of traffic from the proposed six-lane highway.

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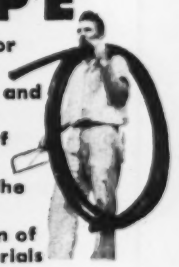

- Won't Rot, Rust or Corrode
- Extremely Light and Easy to Handle
- Has High Rate of Flow
- Easy to Join on the Job
- Resists the Action of Destructive Materials

Plastic pipe has extraordinary advantages it will pay you to investigate. Four types are made by Triangle—FLEXIBLE, SEMI-RIGID, RIGID HIGH IMPACT and RIGID P.V.C. They are all easy and economical to handle and install. They are highly resistant to the action of various destructive materials—chemicals, wastes, crudes, brine, for instance and all are guaranteed not to rot, rust or corrode.

Check These Four Types
see how they can help you:

FLEXIBLE: Excellent for use in mines, jet wells, irrigation and draining systems, conveyance of acids and alkalis, in golf course watering systems, anyplace where a light, flexible pipe is needed. Made of Polyethylene.

SEMI-RIGID: Use it for gathering lines in the petroleum industry, use it for gas service entrance lines (you can feed plastic pipe of a smaller diameter right into old, corroded pipe), use it for chemical piping or in the food industry. Made of Butyrate.

RIGID HIGH IMPACT: To be used wherever an extremely tough, chemically inert plastic pipe is desired; water treatment plants, chemical and industrial waste disposal applications, sewage disposal plants, paper plants and bleacheries (it's *designed* to handle chlorines and bleaches).

RIGID POLYVINYL CHLORIDE: A rigid, tough pipe that has extraordinary resistance to most chemicals—oxidizing acids, caustics, alkalis, animal and vegetable oils, alcohols, inorganic salts and many others. Well suited for applications such as: water treatment plants, pulp and paper piping, gas processing, etc.

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giving complete physical and chemical properties and limitations.

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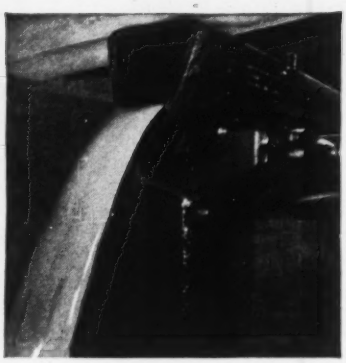
RAW WATER,
TRADE WASTES, SEWAGE

Specify

SIMPLEX TYPE S
PARABOLIC FLUME



CONVENTIONAL measuring devices are often ruled out by adverse conditions: low flows under a low head; wide flow ranges; heavy suspended solids; layout of existing approach.

Simplex Type S Parabolic Flume masters *all* these problems... accurately measures free-flowing wastes or sewage over a FULL 20 to 1 range!

And it's simple to install—requires a minimum of supporting structure with no special approach. Available in 6" to 36" pipe sizes, Type S Flume can be attached to larger sizes by eccentric reducers.

For full details, write: Simplex Valve & Meter Company, 6751 Upland Street, Philadelphia 42, Pa.

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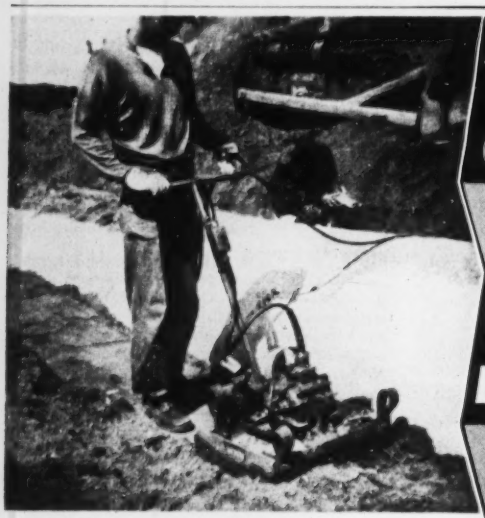
IT'S ACCURATE



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COMPACTOR

RAPIDLY
CONSOLIDATES

PIPE LINE
BACKFILL

TO SPECIFIED
DENSITY

Result — pipe line is uniformly supported by compacted soil and top of trench stays to finished grade. This manually-guided, self-propelling Jackson Compactor will compact granular soils at optimum moisture to specified density in depths of 8" to 12" at the rate of 2400 sq. ft. per hour. It is available with quickly interchangeable base of 12" to 24" and equally advantageous for blacktop pavement widening and patching — paving drives, walks, etc. Operated from Jackson Power Plant mounted on auto trailer with quick pick-up of Compactor. For rent or sale at your Jackson Distributor. Write for details.

JACKSON VIBRATORS, INC. LUDINGTON MICHIGAN

MUNICIPAL

Chicago gets new plan for redevelopment

The Chicago Plan Commission has come up with a new idea for meeting the challenge of suburban shopping centers. It involves isolating existing shopping areas within the city and giving them a "new look."

Under the proposed scheme, traffic would be diverted from existing shopping areas to a "traffic perimeter" around the area. Private vehicular traffic would be eliminated inside the perimeter and residential and other non-shopping structures would be cleared for off-street parking and service.

The shopping area would be reserved for existing store buildings, new commercial structures and large parking lots.

Mass transit and other local vehicles would be the only ones allowed to pass through the area.

Financing of the program would be possible from gasoline tax funds, revenue bonds or by the creation of a limited-dividend development corporation, according to the commission.

Back of the plan is the desire to rehabilitate "neighborhood" shopping areas that have developed with little definite planning. They have been neglected generally in the big push for slum-clearance housing projects.

Schools get money for new buildings

Two colleges recently were approved for dormitory-construction loans by the Housing and Home Finance Agency, while a third school is assured of a new library with funds from other sources.

The University of Kentucky, at Louisville, Ky., got an HHFA loan for $722,000 which will be added to $495,000 of the university's own money for construction of a women's dormitory. Gonzaga University, in Spokane, Wash., is going to build a men's dormitory with an $800,000 loan from the HHFA.

Both schools qualified for the loans because they offer training deemed necessary for the defense effort.

• **New library**—The third school, Virginia Polytechnic Institute of Blacksburg, Va., has just received a gift of $1 million from the Old Dominion Foundation to add to a grant for the same amount from the Virginia General Assembly—the total sum to be used for construction of a badly needed library.

The completed library will have 100,000 sq ft of floor space.

Port improvements planned for San Francisco

A $6-million bond issue for construction of a world trade center and to finance pier improvements at the California-owned port of San Francisco was authorized recently by Gov. Earl Warren and other members of the San Francisco Harbor Bond Board.

The 30-year term bonds, subject to call after 1958, will be the first harbor bonds to be issued entirely on a revenue basis. They will be refunded by the port's operating income.

The state treasurer will call for issuance of the bonds soon.

Construction work—expected to start the middle of October—will include converting the north half of the existing Ferry Building to a world trade center similar to the one at the port of New Orleans, and building a public garage on pilings between the Ferry Building and Pier 1.

The project also calls for conversion of two finger piers—15 and 17—into a single quay-type terminal.

University plans program for campus development

A college campus at Stanford University, on the San Francisco Peninsula—will be the site for a new project to include a shopping center, housing development and industrial area.

It's estimated that Stanford will raise $30-million through its plan to lease a tract of 6,000 acres on a 99-year basis.

• **Land unused**—The campus land is two-thirds of the original grant from the Stanford family, which founded the university more than 60 years ago. Under the terms of the grant none of the property can be sold. The land has remained undeveloped for many reasons, among which are the undetermined need for space for university development and lack of a dependable water supply. The latter has been realized by recent construction through the land of a branch line of San Francisco's Hetch Hetchy water supply.

The university, faced with increasing operating costs, is taking this means of in order to obtain a maximum return on its greatest unexploited assets.

A master plan developed under the leadership of Alf E. Brandin, the university's executive officer for land development, calls for a shopping center to cover 60 acres, a 300-acre tract for light industry, offices and apartment

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Steelcraft recently solved a building problem for one of the nation's largest textile manufacturers. Steelcraft engineers recommended a 200' x 300' rigid frame truss building with 50' clear spans. The finished square foot cost including foundation and erection was much lower than a specially fabricated building of similar design.
Flexibility of design and low cost are assured by Steelcraft's fully integrated manufacturing operation with continuous flow of standard parts, doors, windows from one source . . . delivery timed to meet your construction schedule.
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Briefs from the YEOMANS GUARD

Overall Removal of 91.7 Per Cent at Hope Ark. Treatment Plant Full Report Available

Have you on file the Hurwitz report?—a complete performance report on the Sewage Treatment Plant at Hope, Arkansas, by E. Hurwitz, Chief Chemist of the Sanitary District, Chicago.

The Hope plant is a single-stage Aero-Filter plant in which both primary and final settling is accomplished by Spira-flow clarifiers. It is designed for a population of 5,000 and an ultimate 10,000.

Average removal of suspended solids by primary clarifier was 70 per cent and B.O.D. removal 47.7 per cent. Overall removal effected by the plant was 91.7 per cent.

The Hurwitz Report, complete with tabulated data, is yours for the asking.

☐ Please send the Hurwitz Report

Pneu-Pump Based on Old Principle

Water, oil, mud, paint, tar, acids, alkalis, sludge, molten metals, molten salts, slurries, abrasive liquids and any other "problem child" that pesters you; the Pneu-Pump will handle it—in extremely small volumes. Also this pump is immune to high temperatures; it will operate for years without attention, and its price is agreeably low.

It's a pneumatic pump, simple to manufacture, automatic in operation, practically fool-proof. What more do you process-industrialists want?

A bulletin is yours on request.

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Have You A Hard-To-Handle Un-pumpable Material? . . . Use a TRANSPORTER

Here's the right way to handle heavy, bulky, hard-to-handle materials that cannot be handled economically by centrifugal pumps or by mechanical conveyors—the Yeoman's "Transporter."

It's ridiculously simple, completely automatic, utterly fool-proof—you'll wonder "Why didn't somebody tell me these things?"

The "Transporter" is a pneumatic device that is suitable for such items as the following with extraordinary success:

foundry sand, packing house wastes, tannery wastes, paper pulp, grain, food items, powdered coal, ashes, sludge, screenings, sugar, bagasse and others.

It saves time and work, handles small amounts or big tonnages; and one man at a panel can operate one unit or a multi-unit system. It will move batches to points of use. No moving parts. Ideally clean, self-scavenging—no messy maintenance, absolutely safe.

Inexpensive—very; to install, to operate, to maintain.

Want to know more?—Write us.

☐ Please send new Transporter Bulletin.

The Yeomans Guard, published several times a year, is a compendium of news and useful information covering the pumping of materials and the treatment of wastes, both domestic and industrial. We shall be pleased to send you the current issue if you'd care to have it. Ask your local Yeomans Representative—listed in the telephone book yellow pages under "Pumps"—or write direct.

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buildings, and the remainder of the land for homes.

The plan is based in part on a $16,000 topographical survey from which was determined the best use of each section of land. As Stanford has land in both San Mateo and Santa Clara Counties, planners from the two counties have been included in discussion of the project.

The big question—how to provide roads, water, fire and police protection for the bulk of the land which is outside city boundaries—is still unanswered.

• **Partial use**—Part of the master plan already has been executed, utilizing incorporated areas. Fifteen acres were leased to the Peninsula Pacific Construction Co. for a housing development.

Industrial development got under way with the leasing of land to Eastman Kodak, which will break ground this month for a $2-million film-processing laboratory, and to Varian Associates, who have a $1-million unit of their electronics laboratory almost completed, with another unit scheduled to be started soon. Another parcel of land was acquired by the Menlo Park School District. Peninsula Pacific's 15 acres and the school district section are in Menlo Park, and the two industrial sites are in areas annexed by Palo Alto.

The residential lease served as a guide for the entire development. The land—slightly more than 15 acres—was leased for $78,290 (more than $5,000 an acre) on terms of 10% down and the remainder in four months. The houses sell for $25,000 to $35,000, under an agreement which gives Stanford the right to approve all plans. No more than four houses may be built on an acre. It's up to the developer to put in the roads and improvements and to pay taxes. Peninsula Construction claims there is less opposition to the lease arrangement than anticipated (About 20% rejected it).

• **Shopping protest**—Announcement of the Stanford shopping center and adjoining 5,000 to 6,000-car parking facilities, planned for the northern tip of the campus fronting El Camino Real, brought protest from nearby Palo Alto merchants, who said it would mean "slow death" for them. They feared the congested downtown center of Palo Alto would lose business to the more accessible campus shopping area.

A committee of Palo Alto businessmen countered by formulating plans

for a $20-million to $30-million shopping center, with parking space for 8,000 cars, to cover 12 large blocks in downtown Palo Alto. The 50-acre plot is now an area of apartment buildings and homes.

Palo Alto's shopping center is still in the "study" stage. Its sponsors say the main question is which of the two centers local residents would patronize. They hope to discover the answer by questioning members of the local civic clubs.

The committee interviewed 75% of the owners in the 12-block area chosen for the center, and it claims that 90% agreed either to sell their property or to invest in the corporation that would be set up to buy the land and build the center.

The proposed plan calls for a double decker arrangement with stores and parking lots on the upper level and additional parking facilities and roads for delivery trucks to be located on the lower deck.

The committee that spurred plans for the center recently was dissolved—a possible sign that support is lacking. Palo Alto's plans for a shopping center did not affect Stanford's intention to break ground for its shopping area in "about a year."

Municipal briefs . . .

• **Denver hotel**—Denver, Colo., may get a $12-million hotel this year if a site can be found. Sponsors are the Murchison Brothers of Dallas, Tex. The proposed structure would have 650 rooms in 14 stories.

• **New Orleans bridge**—The Louisiana highway department is pointing to a Sept. 10 beginning date for construction on a $3-million vertical lift bridge across the Industrial Canal in New Orleans.

• **Baltimore baseball**—Baltimore, Md., is going to enlarge its Memorial Stadium to handle 62,500 spectators. Improvements costing $2.7 million are scheduled to be completed next spring, under a contract recently let. The move is interpreted as an indication that the city wants to be ready in the event that a major league baseball team should decide to move in next year.

• **Viaduct bids near**—Bids for construction of a $4-million viaduct for O'Donnell St. in Baltimore, Md., are expected to be taken shortly. Only hold-up now is acquisition of one small parcel to round out the right-of-way.

Laying highway base without hand labor — 8 tons accurately placed in 45 seconds

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costing half the price of bituminous pavers, did all work of placing 12" base of 3½" stone in 8" courses, loose lay. Averaged 45 seconds to unload trucks, spread 11' strip flush to berm, blend joint and strike off. Quickly adjustable for widths to 12½'. Larger size also available for biggest trucks.

Lays all aggregates, free-flowing bituminous mixtures or plant-mixed stabilized soil — highway and airport base, base and top of secondary roads, parking areas, drives.

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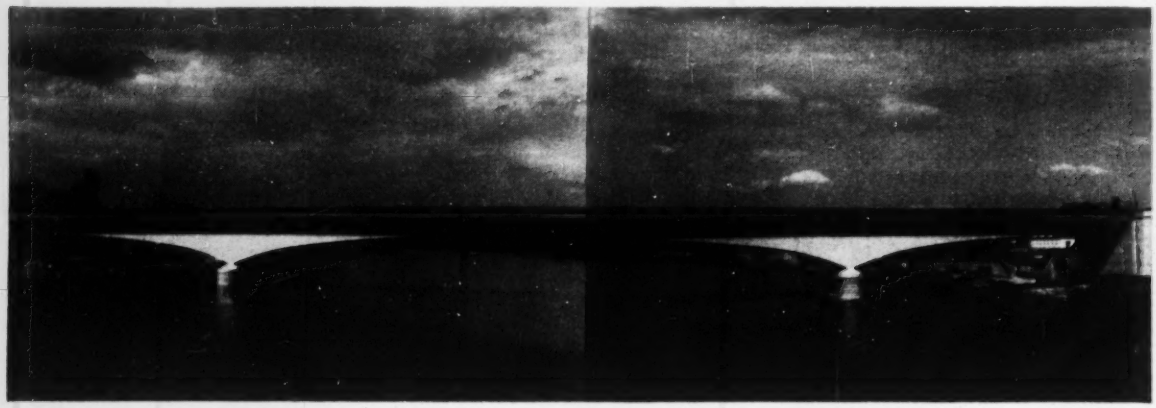


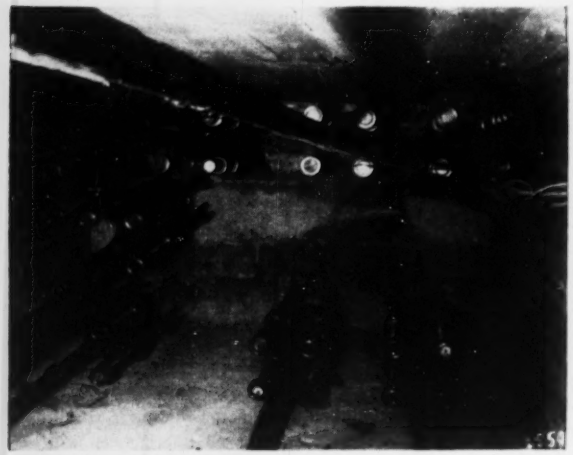
CONCRETE CANTILEVER BRIDGE, over the Seine, between Villeneuve and St. Georges, near Paris, has a 256-ft prestressed hollow-girder center span incorporating a 128-ft suspended span 7½ ft deep.

Cable trusses prestress bridge

Concrete was prestressed by a novel arrangement of steel cables in the new Villeneuve-St. Georges Bridge over the Seine River, near Paris, France. The cables are placed in a truss-like arrangement in three-cell hollow girders. Thus, the tensioned steel is accessible for inspection and can easily be adjusted to correct for loss of tension due to shrinkage and plastic flow of the concrete and creep of the cable.

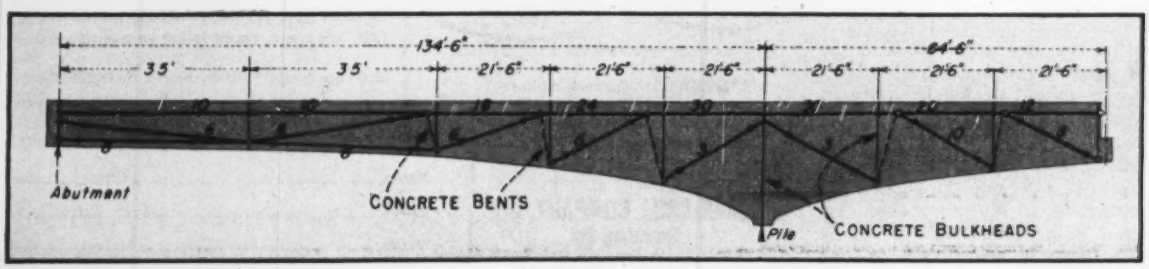
Of cantilever construction, the bridge is 526 ft long. Anchor arms are 135 ft long, and cantilever arms are 64 ft long. The cantilever arms support a suspended girder measuring 128 ft in length.

The three-cell hollow girders are 30 ft wide, each cell being 9 ft wide inside. They are 22 ft 6 in. deep at the piers, 7 ft 6 in. at the center of the



PRESTRESSING CABLES, both horizontal and diagonal, were placed inside the hollow girders.

ANCHORAGES for socketed cable ends consist of steel castings bolted to concrete bulkhead.



INSIDE THE GIRDER, the prestressing cables are arranged like truss members. Circled numbers indicate the number of cables in the three-cell girder. All cables are 2½-in. dia. with 193 wires, and are stressed at 176 tons each.

Intermediates that last like photographs

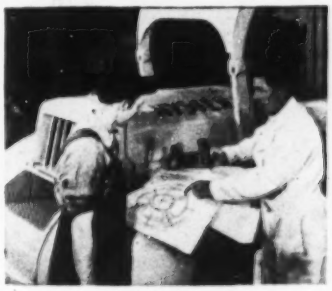
...produced at low cost

A case history based on the experience of the Hyster Company, Portland, Oregon

By reproducing its engineering drawings on Kodagraph Autopositive Paper, the Hyster Company gets intermediates which have dense black photographic lines on a translucent, highly durable paper base. *Intermediates* which will remain intact in the files year after year . . . and produce sharp, legible blueprints and direct-process prints whenever needed.

And the cost is surprisingly low because Kodagraph Autopositive Paper boasts unique photographic properties which cut production costs *substantially*. It can be handled in ordinary room light . . . and it produces positive copies *directly*—without a negative step.

Furthermore, existing equipment can be utilized—Autopositive can be exposed in any blueprint or direct-process machine ...and processed in standard photographic solutions. Hyster uses a blueprint machine which has also been designed to produce Autopositive intermediates in a continuous flow.



How The Hyster Company Uses Autopositive

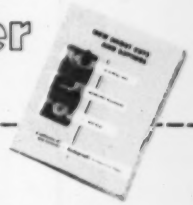
For All Print Production. Autopositive intermediates are used instead of valuable and perishable original drawings. Producing sharp, legible blueprints and direct-process prints time after time, they greatly reduce the possibility of reading errors in the shop.

For "Permanent" Files in its home office . . . and branches in the United States and abroad. "Photolasting" Autopositive intermediates eliminate the costly delays experienced in the past when intermediates faded, turned yellow, or became brittle.

For Drafting Room Short Cuts. Autopositive Paper is used to reclaim old and weak-lined drawings . . . and to duplicate standard designs which will be incorporated in new drawings. *All of which saves hours of creative drafting time.*

Kodagraph Autopositive Paper

"THE BIG NEW PLUS" in engineering drawing reproduction



Learn in detail all the ways you can use Kodagraph Autopositive Paper – the revolutionary photographic intermediate material which you, or your local blueprinter, can process *quickly . . . economically . . . at a low cost.*

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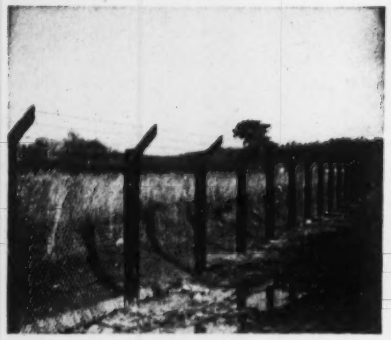
Alabama Industrial Plant SAVES $5,000

with Koppers Pressure-Creosoted Posts



NOT long ago, an industrial concern decided to erect a 4,600-foot fence around its Alabama plant area. The bid received on a conventional chain link fence with steel posts embedded in concrete was $15,654.14. When they checked with Koppers they found that they could save $5,000 by using Koppers pressure-creosoted posts.

Needless to say, they installed pressure-creosoted posts. No concrete was needed—the posts were set directly in the ground. The link fence, supported by heavy wire was easily attached to the strong, sound wood. They were so pleased with their chain link fence on pressure-creosoted posts that they have installed a similar fence at another plant.

Koppers pressure process forces creosote deep into the wood . . . gives it long-lasting service for years and years. In fact, Koppers posts are known as 30-year posts. They are available in sawn or rounds in almost any size.

For further information, write your nearest Koppers Office.

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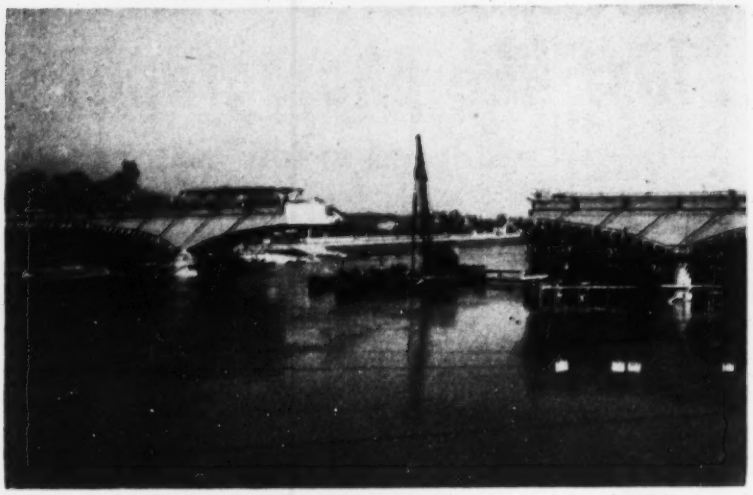
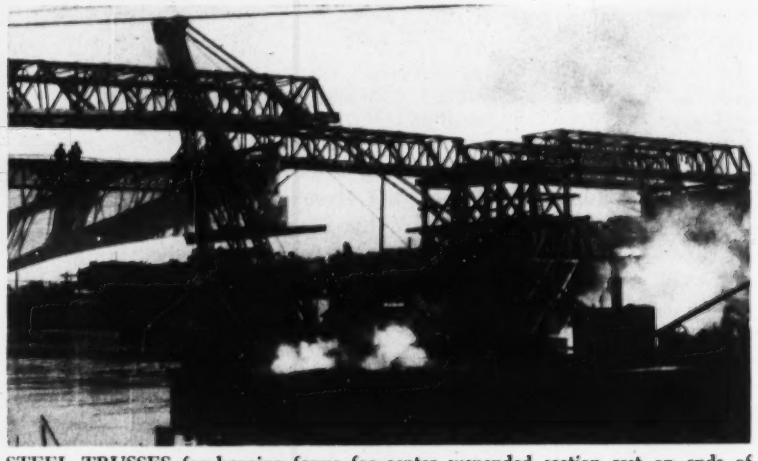
KOPPERS PRESSURE-TREATED WOOD



ANCHOR AND CANTILEVER ARMS were built on falsework. A navigable channel was kept open even during forming of center section.



STEEL TRUSSES for hanging forms for center suspended section rest on ends of cantilever arms and on falsework built in mid-stream.

CABLE ANCHOR ASSEMBLY has twelve stirrup anchors to be embedded in concrete. View shows jack in position.

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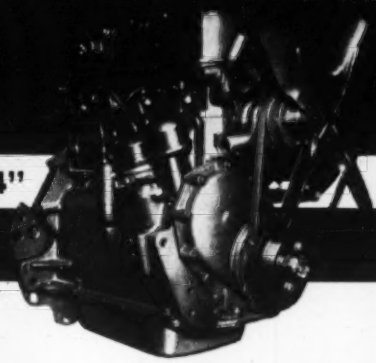
meet America's most popular power needs!



FORD "134" 4-CYL., O.H.V.

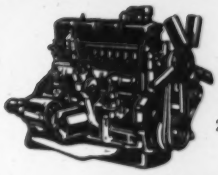
Ford's Overhead Valve Industrial Engines have been thoroughly tested and highly accepted for industrial applications in the field, and now a 4-cylinder power plant of the same type is being offered. This Ford "134" cu. inch engine incorporates notable advancements for still greater performance and operating economy. Bore: 3.4375 in. Stroke: 3.6 in. Rating (dyn.): 45 b.h.p. @ 2400 rpm.

Manufacturers of powered equipment throughout the U.S.A. are constantly in search of economical power to speed productive activities and increase profits.

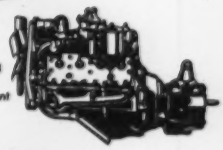
Because of its efficient mass production methods and nationwide service facilities, the Ford Motor Company is a popular source of economical, low-cost Industrial Power. *Here* on this page are the engines which Ford has designed and built to its famous Hi-Precision standards *especially* for the needs of Industry.

You'll find these Heavy Duty Engines at work today powering equipment in our vast oil fields, on our farms and in factories, around logging camps, sawmills, road building and huge construction projects.

If you're interested in any of the engine series shown, one of Ford's Staff of Sales Engineers will be glad to discuss your power problem and perhaps help you solve it advantageously.



FORD "215" 6 cyl.
Industrial Engine
215 cu. in. displacement



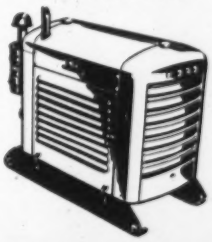
FORD "239" V-8
Industrial Engine
239 cu. in. displacement

FORD "254" 6 cyl.
Industrial Engine
254 cu. in. displacement

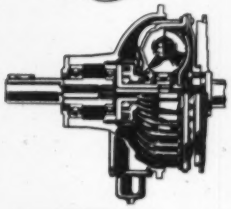
FORD "279" V-8
Industrial Engine
279 cu. in. displacement

FORD "317" V-8
Industrial Engine
317 cu. in. displacement

TYPICAL FORD CLOSED TYPE POWER UNIT



FORD MULTA-TORQUE CONVERTER



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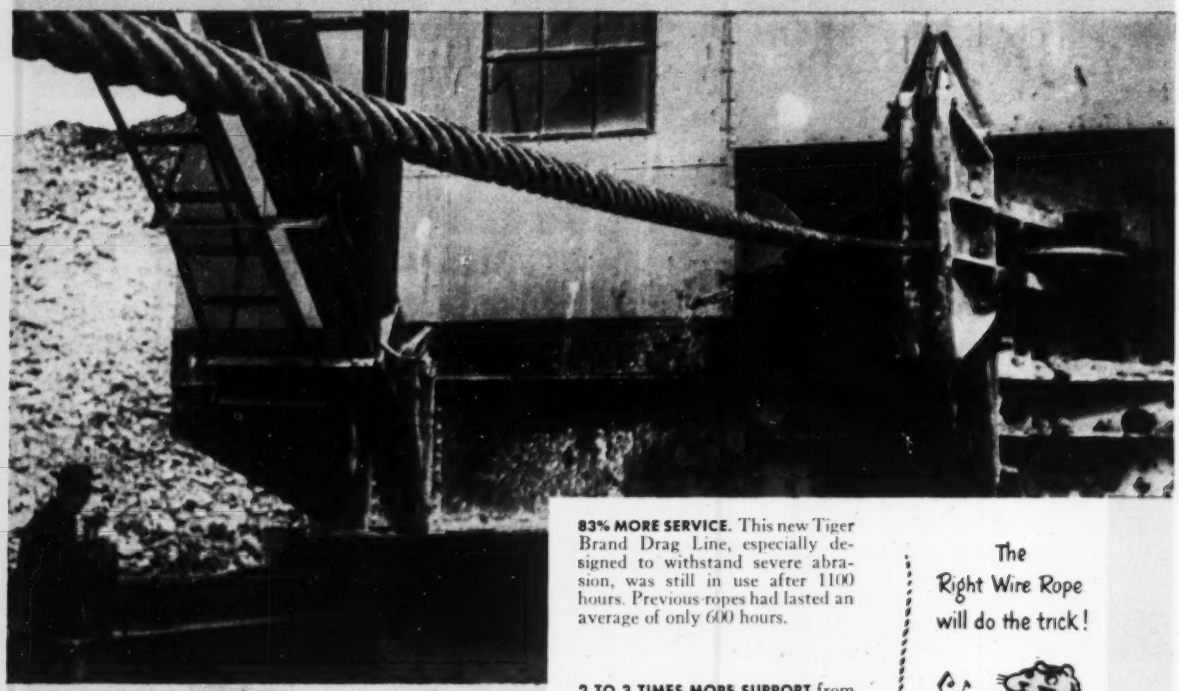
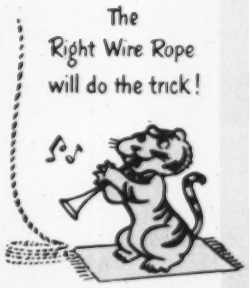


83% MORE SERVICE. This new Tiger Brand Drag Line, especially designed to withstand severe abrasion, was still in use after 1100 hours. Previous ropes had lasted an average of only 600 hours.

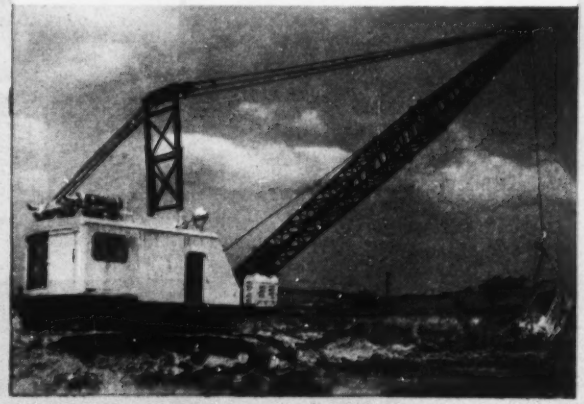
2 TO 3 TIMES MORE SUPPORT from these Tiger Brand Boom Supports. Interwoven ends distribute vibration over a long section of the rope instead of letting it concentrate at one point. As a result, these ropes last longer and cut boom support costs as much as 50%.



• Tiger Brand Wire Ropes are designed for the particular type of job on which they are intended to work. They have the needed balance of strength, toughness, flexibility and wear resistance. The quality is carefully controlled, from the iron mines to the finished product, and by our *own* engineers. Rigid tests and inspections at every step of the way guarantee a rope that matches the design specifications.

In addition, we maintain a staff of experienced Wire Rope Engineers to advise customers the correct rope to use, so that they get the best rope for every job.

Consult these men the next time *you* need rope. They can help you get longer service and cut rope costs.



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suspended span, and 8 ft at each abutment. They carry on top a roadway 27½ ft wide plus two sidewalks on cantilever brackets.

At abutments and piers, the girders rest on spirally reinforced concrete rockers. One support of the suspended section is fixed and the other end is a concrete rocker.

Prestressing cables are so arranged and stressed that the bending moments in the girders are very small under dead load. Under the most unfavorable live-load condition, compression in the concrete will never be less than 70 psi. This will insure no cracking. Design maximum unit stress in the concrete was 1,422 psi.

Each cable consists of 193 wires with ultimate strength of 240,000 psi. Each was stressed initially to 176 tons, or 92,000 psi. A lead-filled socket similar to that used on bridge cables was attached to the ends for anchorage purposes. The sockets engage a steel casting held by four bolts that are fastened to steel bars encased in concrete bulkheads.

Changes in direction of the cables generally are accomplished by bending them around an inclined reinforced concrete strut that is hinged at the base to permit it to rotate. In the suspended span, however, the struts are made of cast steel since they are short.

To maintain river traffic at all times, the cantilever and anchor arms were built on falsework, leaving a navigable channel 118 ft wide. When the concrete in the cantilever arms had attained sufficient strength, the falsework was removed, and some of the cables were stressed enough to counteract tensile stresses from the cantilever.

Then, a falsework tower was built in the middle of the river to support steel trusses from which forms for the center span were hung. The other ends of these trusses rested on the cantilever arms. This left a 108-ft wide channel on each side of the falsework.

While the weight of the center span was being added to the ends of the cantilever arms, the slopes of the concrete struts around which the cables were bent were adjusted. In its final position, the axis of each strut had to bisect the angle formed by the cables.

The bridge was designed by Henri Lossier, consulting engineer of Paris, in collaboration with the French Ministry of Public Works. The contractor was Establissements Fourre & Rhodes of Paris. A more detailed description of the bridge was given in a paper by Mr. Lossier and Michel Bonnet at the Fourth Congress of the International Association For Bridge and Structural Engineering.

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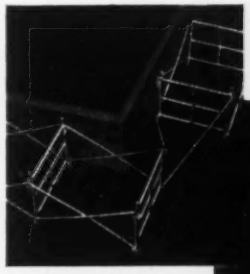

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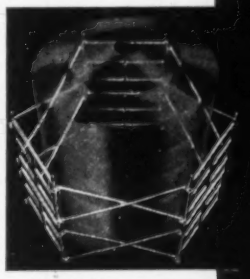
Swivel action and diagonal cross-bracing permits the use of braces to "tie-in" when making a 90° turn.

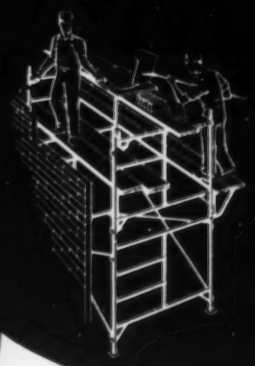
"Up Faster- no bolts to master" with GRAVITY-LOCK

No loose parts—ends of braces with locking triggers are zinc-plated, slip easily into locking sleeves on the panel legs. Finger-tip action releases the rust-proof locking trigger for easy disassembly.



CIRCLING

Ezebilt's swivel action sleeve-lock makes it easy to scaffold round stacks and various cylindrical structures.



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Simplified with Ezebilt SU type panels to provide open passageway thru the lifts. Four plank bearing levels available with use of side brackets.

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COMBINE standard Ezebilt panels with Universal Endlok pipe-and-clamp to scaffold steeples and structures of irregular shape.

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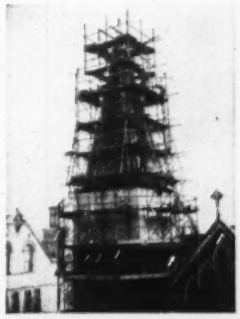

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Reclamation engineers get assignments in Middle East rehabilitation plan

The Bureau of Reclamation is lending more engineers to help modernize the lands of the Bible. They're going to Egypt, Iraq, Iran, and the Hashemite Kingdom of Jordan to work on such problems as river control, hydroelectric power development, irrigation farming, and rural development.

Carl P. Vetter (picture), chief of the regional office of river control at Boulder City, Nev., is going to Iraq for 16 months to see what can be done about controlling civilization's most ancient rivers, the Euphrates and the Tigris. He'll work with the American consulting engineering firm, Knappen-Tippetts-Abbett-McCarthy, of New York City, which has a private contract from Iraq to study the rivers and prepare plans and specifications for dams and other structures.

Vetter expects to be right at home. "The Euphrates and Tigris Rivers resemble in many respects the Colorado and the Rio Grande," he says. While he's in the Middle East, his regular job will be handled by his assistant, John W. Stanley, who will also pinch-hit for him in handling the affairs of the U. S. Committee on Large Dams, of which Vetter is chairman.

Several other Reclamation people are on Point Four missions. Ellis L. Armstrong, in charge of construction of Trenton Dam on the Republican River in Nebraska, has a 60-day assignment as one of a 10-man mission to assist the Egyptian government on rural development and resettlement. He'll advise on water resources. The U. S. plans to contribute $10 million to a $25-million program aimed at bringing the Nile River to irrigate land at present unusable.

Robert F. Hamilton, an electrical engineer who recently joined Reclamation from an overseas job with the Mutual Security Agency, will spend two years in Iran as chief of the power and utilities branch, engineering and construction division, of the staff of the Technical Cooperation director.

Three others—Leland K. Hill, Edward A. Abdun-Nur, and Darwin H. Jepsen—will study hydroelectric power and irrigation farming possibilities along the Jordan and Yarmuk rivers in Hashemite Jordan.

CARL VETTER—He'll work out ways to tame the Tigris and Euphrates.

Myers may get a chance to solve some big traffic jams

Dwight T. Myers, innovating traffic engineer of Providence, R. I., may get a chance at some of the world's biggest traffic snarls. He'll find them in New York City, where he has been proposed as deputy traffic commissioner. He would be "operations officer" of the department at $12,000 a year.

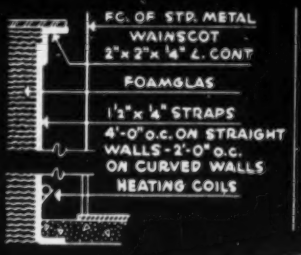
Myers says he'll accept, provided New York's Traffic Commissioner T. T. Wiley can do something about the requirement that no one can be on New York City's payroll unless he has been a city resident for three years. However, an exemption can be granted, and Wiley is working on this.

Myers, a Yale University graduate traffic engineer, went to Providence from the Boston office of the Federal Public Roads Administration under a new state law which gave the traffic engineer jurisdiction over highway controls, traffic signals, and parking rules.

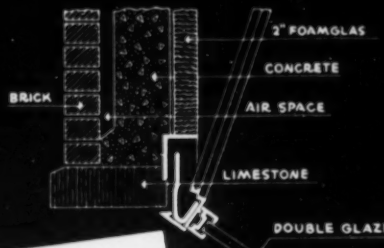
In four years, he practically remade downtown Providence streets, effecting a complicated series of changes with minor capital expense. A circular pattern in two of the city's biggest squares is called "Myers' maze" because of its intricacies.

Other Myers' accomplishments: a large-scale downtown parking plaza which paid for itself in one year; the start of an offstreet parking garage program, and integration of regular traffic with public transit.

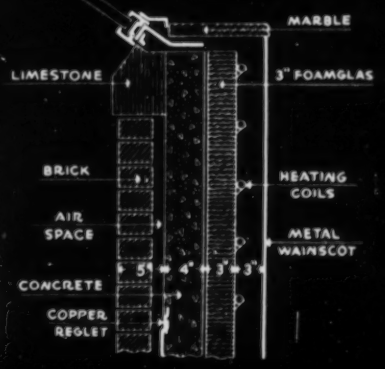
Though some of his schemes caused raised local eyebrows at first, nearly all have worked. That's why Myers has won the co-operation of everybody in town—including the store owners who vigorously opposed him at the start.



TYPICAL SUPPORTS FOR HEATING COILS



TYPICAL WALL SECTION



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Careers . . .

• **Appointed**—**Ford Kurtz** has been named president of J. G. White Engineering Corp. to succeed the late Gano Dunn. **Edward N. Chilson** becomes chairman of the board . . . **Col. Charles H. Bonesteel, III,** will succeed **Col. Lawrence J. Lincoln** as Kansas City district engineer in July . . . **Lewis B. Moore,** director of supply and service for the Panama Canal, has just retired after 32 years to take a post with Knappen-Tippetts-Abbett-McCarthy . . . **Cleon S. Criswell** has become vice-president in charge of production for American Encaustic Tiling Co. . . . **Paul G. Martin,** highway planning engineer for the Kansas State Highway Commission, has joined the engineering staff of the Automotive Safety Foundation. He'll act as supervising engineer of its Louisiana highway study . . . **Lt. Col. Henry E. Helmboldt** will be area engineer in charge of Corps of Engineers construction in Labrador.

• **Local Government Appointments**—**Richard S. Holmgren** succeeds the late **Joseph L. Burkholder** as chief engineer and general manager of the San Diego County Water Authority . . . **Glenn Hall,** planning director for Sacramento, Calif., becomes planning engineer of the larger city of Oakland, Calif. . . . **George F. Welch** is now a district maintenance engineer for the Minnesota Highway Dept.

• **Elected**—Metropolitan Builders Assn. (New York Chapter of Associated General Contractors) has elected: President, **Col. Charles A. Selby;** first vice-president, **Philip Grove;** second vice-president, **Neil Horgan;** secretary, **W. J. Barney, Jr.;** treasurer, **John D. Hegeman** . . . **Robert B. Brooks,** consulting engineer, has been elected to the St. Louis Board of Freeholders to study the transit situation . . . Home Builders Assn. of Greater Kansas City has elected: president, **Stanley Cowherd;** vice-president, **Larry Winn, Jr.;** treasurer, **A. L. Huber, Jr.;** secretary, **Germain Morgan** . . . Newly elected officers of the Expanded Shale Institute are: president, **S. Carl Smithwick;** first vice-president, **W. W. Allen;** second vice-president, **Alex McVoy;** secretary, **George Bickel;** treasurer, **A. R. Waters** . . . **Albert M. Higley,** Cleveland construction man, has been named chairman of the board of directors of the Cleveland Chamber of Commerce . . . The North Carolina Society of Surveyors has elected **A. Corey** as president. **B. W. Paschal** is vice-president and **E. W. Ruggles,** secretary-treasurer.

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Fig. III—Special stadia hair arrangement, furnished upon request.

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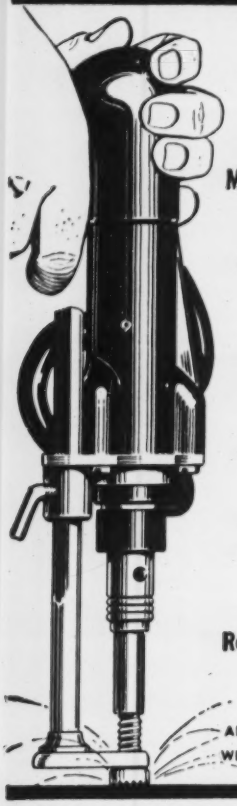

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OBITUARIES

Joseph L. Burkholder, 68, general manager and chief engineer of the San Diego County Water Authority and a leading figure in the building of the San Diego Aqueduct, died in a hospital at San Diego, Calif. April 6 after a 10-day illness. He had held the Water Authority position for nine years.

Burkholder was a leader in the campaign which has resulted in construction of a second barrel to the aqueduct which connects with the Los Angeles Metropolitan Water District Aqueduct to transport Colorado River water from Parker Dam to San Diego.

Most of his life had been spent in water development work. In 1910 he went to work for the Bureau of Reclamation and was chief drainage engineer for all bureau projects when he left the government agency in 1922 to spend two years in Santo Domingo as engineer working on an irrigation project.

From 1926 to 1932 he was chief engineer of the Middle Rio Grande Conservancy District in New Mexico, which was an $11-million irrigation project.

He joined the Los Angeles Metropolitan Water District in 1932 as superintendent of construction and later became assistant general manager. In 1942 and 1943 he directed construction of several Caribbean area Navy bases.

Later, during his years with the San Diego County Water Authority, a member agency, he became a director of the Los Angeles Metropolitan Water District.

He studied at the University of Kansas but left in 1908 before graduation. Forty years later the university bestowed upon him a citation for distinguished service in his profession.

Albert Andrew Wilson, 79, engineer and former manager of the Wahiawa Water Co., died April 8 at Wahiawa, Hawaii. As a general contractor from 1899 to 1915 he built many roads, dams and water projects. From 1915 to his retirement in 1947 he managed the water company.

Robert Curtis Cutting, 71, retired New Orleans civil engineer, died April 14. For nearly 20 years he was with the New Orleans district, Corps of Engineers. He retired in May, 1950. He was a graduate of Massachusetts Institute of Technology in 1905. From 1914 to 1922 he was engaged by the government of Australia in the development of a series of lakes and dams on the Murray River. He returned to the United States and took up his duties with the Corps of Engineers.

Charles P. Utz, 70, president of the Alexander, Shumway & Utz Co., Rochester, N. Y., industrial contractors, died April 10. He was a graduate of Cornell University and in 1910 became a partner in the company he later headed.

Nathan H. Jones, 67, a civil engineer and project manager for the Fluor Corp. of Los Angeles, died in N. Y. City April 19. His most recent work was on the enlargement of an air field in Saudi Arabia for the United States government.

Lewis F. Moody, 73, professor emeritus of hydraulic engineering at Princeton since 1948 and consultant to the Worthington Pump and Machinery Corp. of Harrison, N. J., died at Plainfield, N. J., April 19. Prof. Moody was best known for his work to improve the efficiency of hydraulic turbine pumps and propellers while with the I. P. Morris Co. and Wm. Cramp & Sons Ship and Engine Building Co. He was the inventor of the spreading draft tube for hydraulic turbines.

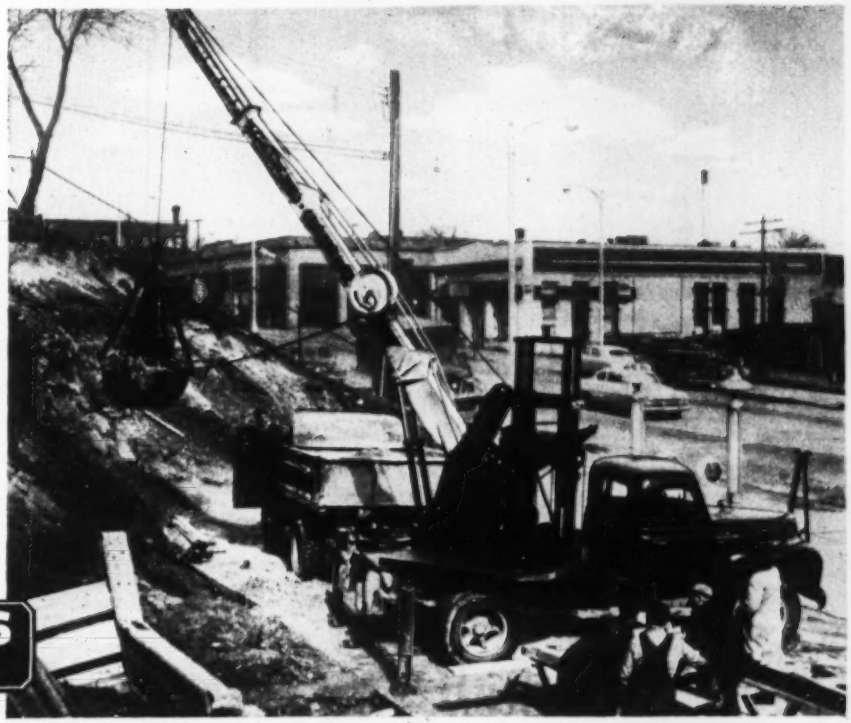
Clyde W. Wood, 62, Southern California contractor and manufacturer of heavy construction equipment, died recently in Pasadena, Calif. President and founder of Clyde W. Wood, Inc., general contractors, and Wood Manufacturing Co., he had been in the general contracting business for more than 30 years.

Arthur T. Ford, 60, Janesville, Wis., contractor and head of the Ford Construction Co., died April 8.

E. H. Walpole, 60, former president of the Oklahoma chapter of the Associated General Contractors and president of the Chas. M. Dunning Construction Co. of Oklahoma City, with which he was associated for 46 years, died April 12 in Oklahoma City.

J. W. Guyn, 69, for 31 years city engineer of Lexington, Ky., died April 14.

Howard E. Borders, 46, Kentucky state highway department engineer for more than 21 years, died at Louisville April 17. He was office engineer of the Louisville district.



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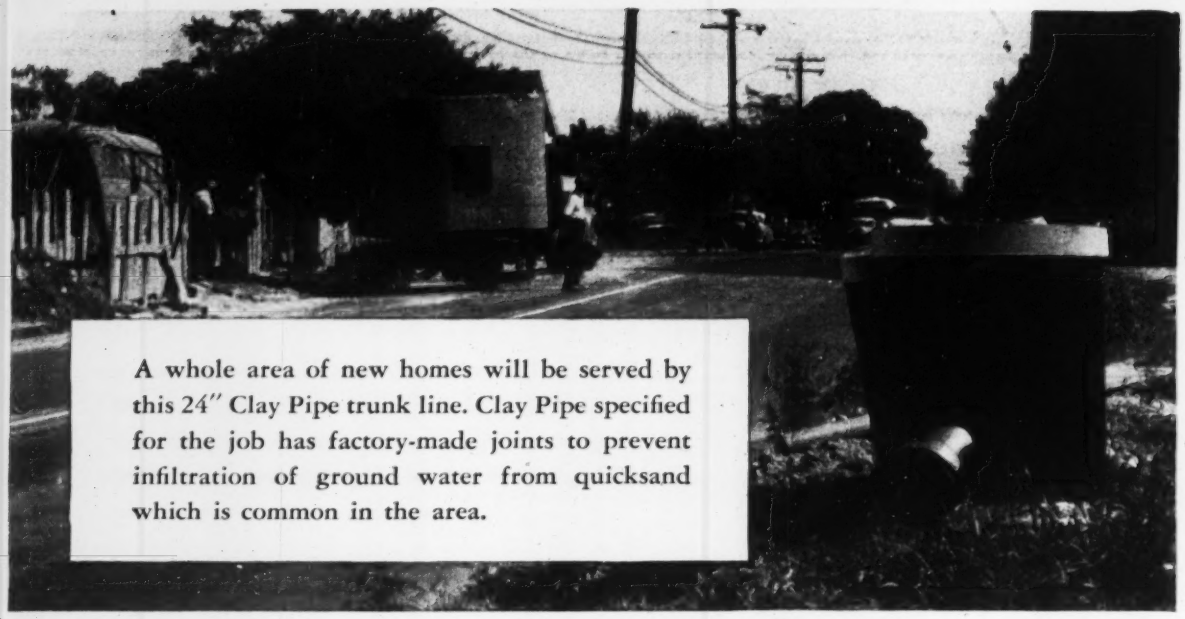

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. . . SAYS JOHN R. CLOYD, CITY ENGINEER IN CHARGE OF THIS TRUNK-LINE SEWER PROJECT IN ROCKY RIVER, OHIO.

Rocky River, a suburb of Cleveland, is having the same growing pains that are cramping thousands of other communities located near big defense-industry centers. And Rocky River engineers, like those in so many other cities, are taking advantage of plentiful Clay Pipe to provide never-wear-out sanitary protection for the area.

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

Mass., Fall River—HOSPITAL—B.A. 5/15—St. Anne's Hospital, 795 Middle St., hospital addn. $350,000; Tallman, LaBrode & Roundsville, 222 Union St., New Bedford, archts. CD 9/14/51.

▲ **R. I., Providence**—HOSPITAL—B.A. 5/21—Rhode Island Hospital, 593 Eddy St. (selected list of bidders), hospital, Eddy and Lockwood Sts., $7,000,000. Shepley, Bulfinch, Richardson & Abbott, 1 Court St., Boston, Mass., archts. CD 818.

SOON LETS CONTRACT—BUILDINGS

Mass., Arlington—TELEPHONE—New England Telephone & Telegraph Co., 185 Franklin St., Boston, soon lets contract telephone bldg., Pleasant St. $700,000; Cram & Ferguson, 248 Boylston St., Boston, archts.

Mass., Boston—WAREHOUSE, etc.—At office Perry-Shaw & Hepburn-Kehoe & Dean, archts., 31 St. James Ave., soon lets contract warehouse and display room, Commonwealth Ave. and B.U. Bridge, for General Fireproofing Co., Dennick Ave. E., Youngstown, O. $100,000. CD 9/3.

BUILDINGS

LOW BIDS AND CONTRACTS

Shuman Constr. Co., 32 Supple Rd., Roxbury, Mass. CA Est. $100,000. wholesale meat PLANT, Massachusetts Ave., BOSTON, MASS. Neiv-Stev Corp., 21 Fulton St., Boston, Mass. Bids Apr. 1. CD 3/27.

▲ **B. Perini & Sons, Inc.,** 73 Montwait Ave., Framingham, Mass. LB $3,549,000, est. $3,500,000. Senior High SCHOOL, NATICK, MASS. Town, Supt. Schools, Natick, Mass. Bids Apr. 15. CD 3/4.

Town, Supt. Schools, 159 Church St., Wilmington, Mass. rejected bids Mar. 27, elementary school, Wildwood St., WILMINGTON, MASS. LB $457,440. CD 4/8, under LB.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

▲ **Md., Towson**—SCHOOL—B.A. 5/5—Baltimore Co. Bd. Educ., Aigburth Rd., 3 story, brick, steel Kenwood Senior High School, Stemmers Run Rd., near Christian St. $2,800,000. Plans deposit $50, Taylor & Fisher, 1012 N. Calvert St., Baltimore, archts. CD 10/6.

▲ **Md., Upper Marlboro**—SCHOOL—B.A. 5/5—Prince Georges Co., Bd. Educ., Cherryhill Junior Senior High School, Hyattsville. $2,000,000. Plans deposit $60. John M. Walton, 3510 Rhode Island Ave., Mount Ranier, archt. CD 10/6.

▲ **N. Y., Brooklyn**—HOSPITAL—B.A. 5/13—Dpt. P. Wks., Municipal Bldg., New York Zone 7, general constr.; plumbing; heating and ventilating; electrical work for the modernization and alterations to various buildings, Kings County Hospital, Brooklyn Boro. Plans deposit $100. CD 3/5/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, Zone 1,

American Bridge Division, United States Steel Corp., 71 Bway., New York 6, L.B. $28,807,092, est. $31,-084,000 Contr. C (combination) Tappan Zee Bridge, New York State Thruway, Hudson Sect., Westchester Co.; LB Contr. A $9,959,805, est. $11,234,000; Contr. B LB $18,899,427, est. $19,850,000. Bids April 16 CD 3/24.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, Zone 1,

Lane Constr. Corp., 37 Colony St., Meriden, Conn., LB $7,431,264, est. $9,877,000 Mohawk State Thruway, Herkimer Co.;

White Oak Excavators, Inc., Plainville, Conn., LB $1,-390,268 est. $1,426,000, roads at Pepacton Reservoir, Delaware Co.;

Queens Structure Corp., 32-57 57 St., Woodside, N. Y. LB $783,938, est. $870,000, Sunken Meadow Spur Parkway, Contr. 5, Suffolk Co.;

A. E. Ottaviano, Inc., 82 Brook St., Croton-on-Hudson, N. Y. LB $7,349,570, est. $8,903,000. New York State Thruway, Catskill Sect., Ulster Co.; LB. $965,-074, est. $1,242,000, Sawmill River Parkway, Westchester Co. CD 3/24.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

Arthur A. Johnson Corp., 347 Madison Ave., New York 17, N. Y., LB $2,348,650, est. $2,633,000, grading, drainage foundation work 0.49 mi. in connection with new 527 ft. bascule bridge carrying the New England sect. of New York State Thruway over Eastchester Creek, west of Hutchinson River Parkway, south of Bronx-Westchester Co. line, Bronx Co. Bids Apr. 16. CD 3/24.

Whiting-Turner Contg. Co., 304 National Bank Bldg., Baltimore, Md. CA 3 bridges, southwest Baltimore to eliminate grade crossings, rein.-con., steel earthfill approaches, BALTIMORE, MD. Baltimore & Ohio R.R. Co., A. C. Clarke, ch. engr., Charles and Baltimore Sts., Baltimore, Md.

BUILDINGS

LOW BIDS AND CONTRACTS

Carcaise Constr. Co., 451 Virginia Ave., Rochester, Pa., CA. Approx. $450,000. 43x191 ft. brick, steel CONVENT addn., BADEN, PA. St. Joseph's Convent, c/o Mt. Gallitzen Academy, Baden, Pa.

Allegheny Building Co., 899 Bingham St., Pittsburgh, Pa. CA. $400,000. 2 story, bsmnt., brick, block, steel parochial SCHOOL addn., CASTLE SHANNON (Br. Pittsburgh), PA. St. Ann's R. C. Congregation, Castle Shannon, Pa. C. A. Lake, 203 Highland Terrace, Pittsburgh, Pa., archt.

F. J. Busse Co., 1579 Noblestown Rd., Pittsburgh, Pa. CA. Approx. $600,000. CHURCH and SCHOOL, NATRONA HEIGHTS, PA. Blessed Sacrament R. C. Church, 1526 Union Ave., Brackenridge, Pa., Alfred D. Reid Assoc., 324 Fourth Ave., Pittsburgh, Pa., archts.

† **Five Boro Constr. Corp.,** 2 Lafayette St., New York, N. Y. CA $1,273,769. altering 7 buildings for CLASSROOMS, NOY 70049, Spec. 31673, ANNAPOLIS, MD. P. Wks. Office, Severn River Naval Command, Annapolis, Md. CD 2/18, under LB.

▲ **Gardens Constr. Co.,** 2406 Greenmount Ave., Baltimore, Md. CA $2,330,947. 1 story, 70x735 ft., brick Brooklyn Park Junior Senior High SCHOOL, Brooklyn PARK, ANNAPOLIS, MD. Anne Arundel Co., Bd. Educ., Annapolis Md. CD 4/15, under LB.

E. Eyring & Sons Co., 800 S. Conklin St., Baltimore, Md. CA $300,000. concrete, steel, masonry CHURCH Pratt and Hornell Sts., 9½ acre tract, BALTIMORE, MD. Our Lady of Fatima R. C. Church, 600 S. Conklin St., Baltimore, Md. John F. Eyring, 3505 Fait Ave., Baltimore, Md., archt.

▲ † **U. S. Eng.,** First and Douglas Sts. N. W., Wash., D. C. rejected bids Mar. 5. PLANT and SCIENCE LABORATORY, SOILS PREPARATORY BLDG., CLASSIFIED BLDGS., CAMP DETRICK, MD. LB $1,414,000. Will re-advertise. CD 3/9, under LB.

Manor Country Club, Norbeck, Md. rejected bids Apr. 9, rebuild clubhouse, Norbeck, ROCKVILLE, MD. LB $330,000. Will re-advertise. CD 4/15, under LB.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction
(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

South Carolina—RURAL DISTRIBUTION LINES—B.A. 5/5—Central Electric Power Co-operative, Cornell Arms Bldg., Columbia, rural distr. lines, Berkeley and Williamsburg Counties. Plans deposit $10. Southern Eng. Co., 1000 Crescent Ave. N. E., Atlanta, Ga., engr. CD 1/19/49.

† **Fla., Green Cove Springs**—RAILROAD PIER REPAIRS—B.A. 5/12—Dpt. Navy, Officer in Charge of Construction, Naval Base S. C., repairs to railroad pier U. S. Naval Station, NOY 77377. Plans deposit $10.

WEST VIRGINIA—B.A. 5/12—West Virginia Turnpike Comm., 1340 Wilson St., Charleston, Zone 5.

Mercer and Raleigh Counties—Contract No. 21 grading, drainage, for approx. 6.32 mi. West Virginia Turnpike incl. relocation of approx. 3.83 mi. U.S. Rte. 19-21 and approx. 1.75 mi. other side roads, incl. temporary relocation of sections of existing U.S. Rte. 19-21 plus constr. substructures for bridges known as structures 10 and 12, located between point 3 mi. north of Camp Creek and about mile 13.7 and village of Ghent mile 20. Howard, Needles, Tammen & Bergendoff, P.O. Box 5266, Capitol Station, Charleston, consult. engrs.; adv. ENR 4/30. CD 4/30/52.

† **Fla., Key West**—PIERS—B.A. 5/14—Dpt. Navy, Officer in Charge of Construction, Naval Base, S. C., repairs to and replacement of Piers D-1 and D-2, Operation Development Station, Naval Base, NOY 77325. Plans deposit $10.

† **S. C., Charleston**—AIR CONDITIONING, etc.—B.A. 5/14—Dpt. Navy, Officer in Charge of Constr., Naval Base, Charleston, air conditioning and altering Bldg. 7, U. S. Naval Shipyard, NOY 77339. Plans deposit $10. CD 7/1.

Ga., Glennville—B.A. 5/21—City, City Hall, WW imprvs. $86,000. Vinson & Co., 30 14 St. N.E., Atlanta, engrs.

BIDS ASKED—BUILDINGS

▲ **Va., Falls Church**—PLANT—B.A. 5/6—Melpar, Inc., 452 Swann Ave., Alexandria, (selected list of bidders), plant. $2,000,000. Perry M. Duncan, 121 E. 54 St., New York, N. Y., archt. CD 11/13.

S. C., Wagener—HIGH SCHOOL—B.A. 5/7—Aiken Co. Bd. Educ., Wagener, elementary-high school. $725,-000. Plans deposit $75. Wm. G. Lyles, Carlisle, Bissett & Wolff, 1321 Bull St., Columbia, archts.

▲ **Ga., Savannah** — HOSPITAL — B.A. 5/27 — Chatham Co. Hospital Auth., Court House, hospital. $4,000,000. Abreau & Robeson, 141 Walton St. N.W., Atlanta, archts. CD 11/7.

SOON LETS CONTRACT—BUILDINGS

▲ **Ky., Covington**—TEMPLE—Masonic Orders, Fourth and Scott Sts., soon lets contract Scottish riete and Masonic temple. $1,000,000. E. C. Landberg & Assoc., 114 Garfield Pl., Cincinnati, O., engrs.-archts. CD 2/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

City, City Hall, Norfolk, Va., Own Forces. $206,000. Stumpy Lake Golf Course, NORFOLK, VA. Bids Mar. 2, rejected, LB, $220,790. CD 3/12, under LB.

J. C. Bledsoe, Blythewood, S. C., CA, $203,305, Rae's Creek Sewerage Project, AUGUSTA, GA. City, City Hall, Augusta, Ga. Bids Apr. 14. CD 3/25.

† **Georgia-Southern Constr. Co.,** 3330 Vineville Ave., Macon, Ga., CA, $770,420, headquarters bldg, Inv. 53-31;

Stillwell Constr. Co., P. O. Box 1334, Macon, Ga., CA, $679,887, central steam plant addns., steam distr. sys., Warner Robins Air Force Base, Inv. 53-42, MACON, GA. U. S. Eng., 200 E. St. Julian St., Savannah, Ga. Bids Apr. 7.

Easton Asphalt Co., Covington, Ky. and **Geo. Beyer Co.,** Fort Mitchell, Ky. CA Est. $130,000, repair, resurf. 29 streets, NEWPORT, KY. City, City Hall, Newport, Ky. Awarded Apr. 10. CD 3/18.

City, City Hall, Bolivar, Tenn. Owner Builds. $200,000. electric lines, BOLIVAR, TENN.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **B. F. Parrott & Co.,** 811 Boxley Bldg., Roanoke, Va., CA. Approx. $1,000,000. 1 story, 225x480 ft. masonry television and radio parts manufacturing plant, North Tazewell, TAZEWELL, VA. Tazewell Manufacturing Co., c/o Saul Goldsmith, archt., 80 Livingston St., Brooklyn, N. Y.

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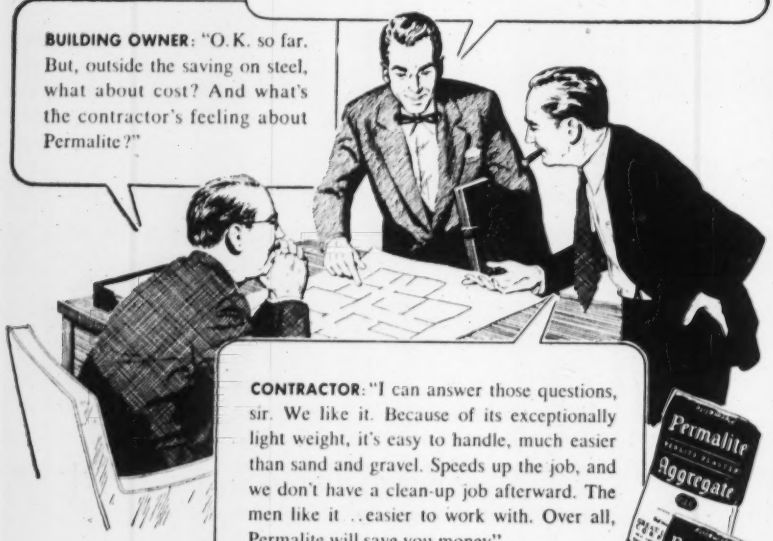

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Pennsylvania Perlite Corp., Allentown, Pennsylvania

Arkla Processing Corp. of Fla., Vero Beach, Fla.
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New Jersey Perlite Corp., Newark, New Jersey

MacArthur Company, St. Paul 4, Minn.
•
McClure & Erickson Corp., Los Angeles, California

Perma-Rock Products, Inc., Baltimore 30, Maryland
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The Whittemore Company, Roslindale 31, Mass.
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Virginia Perlite Corp., Hopewell, Virginia

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▲ † **Batson-Cook Co.**, West Point, Ga., CA, $2,526,000 central repair SHOPS, Marine Corps Depot, Spec. 35231, ALBANY, GA. Dpt. Navy, Officer In Charge of Constr., Box 465 Naval Base, S. C. Bids Mar. 19. CD 3/25, under LB.

Stillwell Constr. Co., Macon, Ga., CA, $324,713 Bloomfield Road Elementary SCHOOL, MACON, GA. Bibb Co. Bd. Educ., Macon, Ga. Bids Apr. 14. CD 1/22/48.

Field & Riley, Inc., Dupont Bldg., Miami, Fla., Owner Builds, $400,000 40 RESIDENCES, FORT LAUDERDALE FLA.

Frank J. Rooney, Inc., 5880 N. E. 4 Ave., Miami, Fla., CA, $600,000 Department STORE, WEST PALM BEACH, FLA. Burdine's, Inc., 305 Clematis St., West Palm Beach, Fla. Bids Apr. 2. CD 3/23.

A. R. Abrams, Inc., 362 Jones Ave. N.W., Atlanta, Ga., CA, $325,000, Department STORE addns., alterations, BIRMINGHAM, ALA. Al Green, c/o contractor.

Dempster Bros., Inc., Springdale Ave., Knoxville, Tenn. Owner Builds. $100,000. PLANT addn., KNOXVILLE, TENN.

Brice Building Co., P.O. Box 1028, Birmingham, Ala., CA, $350,000. Hunter Hall DORMITORY, SEWANNEE, TENN. University of the South, Sewanee, Tenn. CD 2/26/47.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Mich., Redford**—SCHOOL—B.A. 5/7—Redford Twp., John W. Turner, secy., Redford School Dist., Senior High School, Schoolcraft Rd. west of Beech St. $1,750,000. Plans deposit $25, refundable. Giffels & Vallet, Inc., and L. Rossetti, 1000 Marquette Bldg., Detroit, Zone 26, assoc. engrs.-archts. CD 1/15.

Ill., West Chicago—FACTORY, etc.—Bids Asked—Moulded Products Corp., div. of Admiral, 3800 Cortland Ave., Chicago, 1 story, 315x325 ft., steel frame factory, office and engineering rooms. $900,000. Raymond A. Peterson & Assoc., 401 Dempster St., Skokie, archts.

SOON LETS CONTRACT—BUILDINGS

Ill., Chicago—FACTORY—Match Corp. of America, 3431 W. 48 St., Zone 32, soon lets contract, 2 story 13,000 sq. ft. factory. $140,000. A. Epstein & Sons Co., 2011 Pershing Rd., Zone 9, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **William A. Pope Co.**, 26 N. Jefferson St., Chicago, 6, Ill., CA, $985,754 replacement of heating distr. system of the main station and Camp Barry areas, Naval Training Center, GREAT LAKES, ILL. Ninth Naval Dist., Great Lakes Naval Training Station, Great Lakes, Ill. Mar. 27. CD 3/18.

▲ **WISCONSIN**—State Hy. Comn., State Office Bldg., Madison.

Reliance Constr. Co., 1011 S. 8 St., Sheboygan, Wis., LB, $260,735, Contracts 1 and 2, Option "A" b.conc. 11.427 mi. Marshfield-Abbotsford Rd., S.T. Hy. 13, Proj. T 04-4 (9) and T 04-4 (8) Marathon and Wood Counties, LB, $292,695 Contracts 1 and 2, Option "B" b.conc. 11.386 mi. Marshfield-Abbotsford Rd. and Spruce St. (Village of Abbotsford), S.T. Hys. 13 and 29, Proj. T 04-4 (9), T 020-1 (8) and T 020-2 (3) Clark and Marathon Counties;

Rein & Schultz, Inc., 119 E. Washington Ave., Madison, Wis., LB, $515,566, Contracts 1 and 2, Option C, b.conc. 22.813 mi. Marshfield-Abbotsford Rd. and Spruce St. (Village of Abbotsford) S.T. Hys. 13 and 29, Proj. T 04-4 (9); T 020-1 (8), T 020-2 (3), and T 04-4 (8), Clark, Marathon and Wood Counties; LB, $76,406 Contract 1, misc. constr. 0.596 mi. Main St. (Village of Necedah) S.T. Hy. 80, Proj. T 0429 (2), Juneau Co.;

Kramp Constr. Co., Rawson and Howell Sts., Milwaukee, Wis., LB, $847,243 Contract 1, c.conc. West Granville-Waukesha Co. Line Road, U. S. Hy. 41 and 45 and S.T. Hy. 55, Proj. F 03-1 (5) Milwaukee Co.;

Jos. D. Bonness, Inc., 1409 N. 27 St., Milwaukee, Wis., LB, $627,669, Contract 1, c.conc. 5.129 mi. Waukesha Co. Line-S.T.H. 60 Road, U. S. Hy. 41, Proj. F 03-1 (34), Washington Co.;

E & C. Co., 819 E. Burleigh St., Milwaukee, Wis., LB, $801,312, Contract 1, c.conc. 8.594 mi. Waukesha Co. Line-S.T.H. 60, U. S. H. 41-West Bend and Slinger-U. S. H. 41 Road, U. S. Hys. 41 and 45, S.T. Hy. 60, Proj. F 03-1 (14), F 027-1 (2) and F 067-1 (2), Washington Co.;

John Dieseth Co., Fegus Falls, N. D., LB, $282,387 Contract 1, soil cement base course 21.476 mi. Black River Falls-East County Line Road, S.T. Hy. 54, Proj. S 0580 (3), Jackson Co.;

Murphy Constr. Co., Black Creek, Wis., LB, $94,388 Contract 1, b.conc. 2.698 mi. The Neillsville-Granton Road, U. S. Hy. 10, Proj. T 019-2 (1), Clark Co.;

H. Turner & Son, Boscobel, Wis., LB, $498,344, Contract 1, b.conc. 10.679 mi. The Prentice-Phillips Road, S.T. Hy. 13, Proj. T 04-5 (1), Price Co.;

The White Constr. Co., 710 N. Plankinton Ave., Milwaukee, Wis., LB, $194,810, Contract 1, b.conc. 14.392 mi. Eagle River-Michigan State Line Road, U. S. Hy. 45, Proj. F 09-2 (21) Vilas Co.

cancelled bids to have been opened Apr. 14, Contract 1, aggregate for bit. surf. 13.734 mi. Cassville-Bloomington Road, S.T. Hy. 133, Proj. T 0200 (3), Grant Co. Bids Apr. 14. CD 3/27.

City, Otto Eckert, mgr. Bd. Water & Electric Light Comrs., 116 W. Ottawa St., Lansing, Mich. Owner Builds. $400,000. electric servcie, exten. electric service and street lighting Everett Dist., incl. 2 underground cables and automatic sub-station, LANSING, MICH. CD 1/16.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **The Arcose Co.**, 4997 Glenway Ave., Cincinnati, O. Owner Builds. **$1,500,000.** 88 one-family brick bsmnt. HOUSING units, in Highview Subdivision, off Cleves Warsaw Pike, CINCINNATI, O. Joseph M. Allen, 4636 Glenway Ave., Cincinnati, O. engr. Awarded Apr. 15.

▲ **C. Harry Swanson**, 2201 E. Jefferson St., South Bend, Ind., Owner Builds, **$1,000,000,** 50 RESIDENCES, Along Varsity Dr., SOUTH BEND, IND. Bids Apr. 14.

Melvin Home Building Corp., 3452 W. North Ave., Chicago, Ill., Owner Builds, **$300,000,** 13 APARTMENTS, Bellwood Ave. also Jackson St., BELLWOOD, ILL. Robert P. Johnston, 1033 South Bend, Oak Park, Ill. archt. Awarded Apr. 8.

▲ **Algot B. Larson, Inc.**, 3837 W. Lake St., Chicago, Ill., CA, **$1,000,000,** 1 story, 150,000 sq. ft. WAREHOUSE and OFFICE, 2706 W. 79 St., CHICAGO, ILL. Firestone Tire & Rubber Co., 1080 W. North Ave., Chicago, Ill. Bids Mar. 9, awarded Apr. 9. Seward O. Legge, 138 N.E. 50 St., Miami, Fla., archt. CD 2/26.

Roy A. Martin, 105 Riverside St., Montgomery, Ill., Owner Builds, **$500,000,** 50 HOMES, MONTGOMERY and AURORA, ILL. Awarded Apr. 13.

▲ **Kraus-Anderson, Inc.**, 501 S. 8 St., Minneapolis, Minn. CA. Est. **$5,000,000-$8,000,000,** 1 and 2 story, 631x20x160 ft., 618x200 ft., 530x150 ft. and 400x100 ft., SHOPPING CENTER, GLENDALE(P.O. Milwaukee), WIS. Bay Shore Center, Inc. (Sheldon-Thomas, Inc.), National Bank Bldg., Minneapolis, Minn. M. O. Nathan, 343 S. Dearborn St., Chicago St., Chicago, Ill., archt. CD 2/10.

▲ **Combustion Eng.—Superheater, Inc.**, Rand Tower, Minneapolis, Minn., LB, **$1,609,900,** furnishing, installing three steam GENERATING UNITS;

Allis-Chalmers Mfg. Co., Foshay Tower, Minneapolis, Minn., LB, **$353,918,** (2) two turbine generator units and (3) metal clad switchgear, WAUWATOSA, WIS. Milwaukee County Institutions & Dpts., Wauwatosa, Wis. Bids Ap. 9. CD 3/18.

▲ **Thompson-Schmidt Co.**, 18425 James Couzens Dr., Detroit, Mich. CA **$1,282,700.** brick steel, concrete Redford High SCHOOL, 21431 Grand River St., DETROIT, MICH. City, Bd. Educ. 1354 Broadway, Detroit, Mich. (Correction-location and owner). CD 3/31, under CA., Mich., Redford.

E. H. Whitman Co., Ecorse, Mich. CA Est. **$400,000.** 2 story, bsmnt., brick, steel Gerisch Elementary SCHOOL, ECORSE, MICH. Ecorse Twp., 6627 Allen St., Allen Park, Mich. Bids Mar. 16. CD 2/25.

▲ **The Austin Co.**, 227 Curtis Bldg., Detroit Mich. CA Est. **$3,000,000,** brick, steel, concrete, 92,000 sq. ft. 44 ft. high L-shaped BOILER SHOP, 2 wings, 290 and 500 ft. long, Incl. lunch facilities, MIDLAND, MICH. Dow Chemical Co., 932 Fisher Bldg., Detroit, Mich. CD 8/22/51.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **N. M., Roswell**—HANGAR B.A. 5/7—U. S. Eng., Box 1538, Albuquerque, hangar maintenance, Walker Air Force Base., Inv. No. Eng 29-005-53-113. $500,000. Plans deposit $75. Extended date. CD 4/8.

† **Neb., Lincoln**—UTILITIES and STORM DRAIN—B.A. 5/14—U. S. Eng., 1709 Jackson St., Omaha, utilities, storm drain, Line K, at Lincoln Air Force Base, Inv. 25-066-53-137. CD 7/17.

† **Arkansas**—B.A. 5/15—U. S. Eng., 300 Broadway, Little Rock, Arkansas River watershed, Arkansas River, Arkansas, Pile revetment-Mile 120.6, left bank of Arkansas River, Mile 120.6 at Hensley Bar, approx. 3 mi. upstream from Jefferson Co. free bridge, approx. 8 mi. by hy. north of Pine Bluff, Serial No. CIVENG-03-050-53-61. CD 3/9/45.

† **Wyoming**—B.A. 5/19—Bureau Reclamation, Dpt. Interior, Palisades, constr. Snake River bridge superstructure relocation of Wyoming State Hy. U. S. 89, Palisades Reservoir, Palisades Proj. (Idaho) south fork of Snake River, Lincoln Co., near Alpine, Spec. DC 3937. L. N. McClellan, Bld. 53, Denver Federal Center, Denver, Colo., ch. engr. CD 9/12/44, under Idaho.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Century Sprinkler Corp.**, 1401 Roseneath Rd., Richmond, Va., LB. $139,895. water supply for automatic sprinkler sys. at Veterans Admin. Center, HOT SPRINGS, S. D. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Apr. 14. CD 3/12.

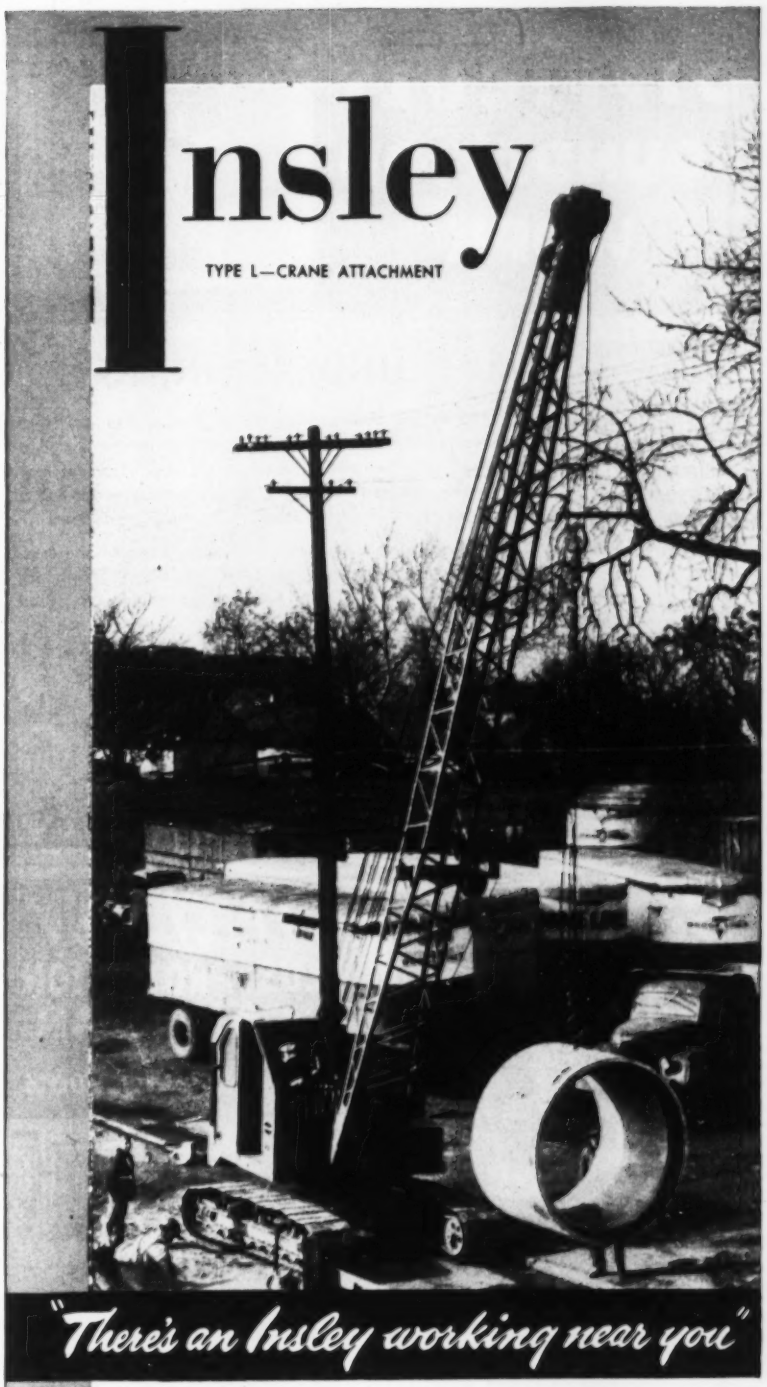
Roy Hofheinz, 4000 Main St., Houston, Tex. Purchase and Hire. **$175,000.** television station, HARLINGEN, TEX. CD 1/16.

Gulf Bitulithic Co., 2502 Galveston Rd., Houston, Tex. CA. $314,000, est. $250,000. asph. paving portions of Park Lane, Broadway, Randal, and Witter Sts. HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex. Lockwood & Andrews, Union Natl. Bank Bldg, Houston, Tex., engrs. Bids Apr. 10. CD 10/7.

Gulf Bitulithic Co., $2820 Polk St., Houston, Tex. LB. $341,500, concrete type paving east of Main St.;

Brown & Root, Inc., Box 3, Houston, Tex., LB. **$344,620,** asph. paving, west of Main St., HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex., Lockwood & Andrews, Union Natl. Bank Bldg., Houston, Tex., engrs. Bids Apr. 8. CD 8/28.

City Public Service Board, 201 N. St. Mary's St., San Antonio, Tex., Own Forces. $175,000, some electric distr. lines extens. on Southside, SAN ANTONIO, TEX. CD 2/13.



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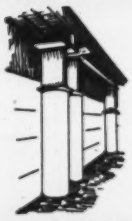

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City Public Service Board, 201 N. St. Mary's St., San Antonio, Tex. Own Forces. $200,000, some general repairs, rehabilitation to existing gas distr. sys., SAN ANTONIO, TEX. CD 1/30.

BUILDINGS
LOW BIDS AND CONTRACTS

Mohawk Securities Co., Victor Bldg., Kansas City, Mo. Owner Builds. $400,000. 42 DWELLINGS, KANSAS CITY, MO. Herbert Duncan, Victor Bldg., Kansas City, Mo., archt.

W. S. Bellows Constr. Corp., 716 N. Everton St., Houston, Tex., CA. $310,000. ramp parking GARAGE, HOUSTON, TEX. M & M Building Corp., M & M Bldg., Houston, Tex. CD 2/10.

Sharp Constr. Co., 2202 Rosslyn St., Houston, Tex. CA. $337,115, 35 DWELLINGS, HOUSTON, TEX. Frank W. Sharp, 2202 Rosslyn St., Houston, Tex. CD 2/3.

▲ Walsh & Burney Co., 928 N. Flores St., San Antonio, Tex., LB. $2,138,205, 5 story, 120-room HOSPITAL addn., SAN ANTONIO, TEX. Santa Rosa Hospital, Houston and Santa Rosa Sts., San Antonio, Tex. Bids Apr. 15. CD 3/12.

FAR WEST

HEAVY CONSTRUCTION
LOW BIDS AND CONTRACTS

▲† U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash., rejected bids Dec. 3, four generators for Chief Joseph Dam, Bridgeport, Inv. 53-21, WASHINGTON. LB $4,406,493. CD 12/9, under LB.

▲† U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. rejected bids Dec. 1, ten 103,300 kva. transformers, Chief Joseph Dam, Bridgeport, Inv. 53-25, WASHINGTON, LB, $1,831,880. Will re-advertise. CD 12/5, under LB.

▲ WASHINGTON—State Hy. Comm., Olympia,
Pacific Sand & Gravel Co., Centralia, Wash., LB $218,881, cement-treated base and b.conc. paving 7.76 mi. Hy. 12, Deep River east Wahkiakum Co.; LB $81,974 bit., non-skid seal and b.conc. paving 8.858 mi. Hys. 2, 3 and 6, Galena east et al, Spokane and Stevens Counties;

Morrison & Lamping, Walla Walla, Wash., LB, $68,457 bit. 3.831 mi. McKay Hollow Rd. FAS S 0633 (1), Columbia Co.;

F. H. Hewett, 420 W. 22 St., Spokane, Wash., LB, $141,150 bit. 14.4 mi. Hy. 3-D, Eureka to Junction with Hy. 2-E, Walla Walla Co.;

Roy L. Bair & Co. 1200 Ide St., Spokane, Wash., LB, $70,822, clearing, draining, grading 3.763 mi. Addie-Gifford and Northport-Deep Creek Rds. FAS Nos. S 0476 (1) and AS 0476 (1), Stevens Co.;

L. D. Shilling Co., Moses Lake, Wash., LB, $203,866, grading, surf. 14.581 mi. Hendricks Scooteney and Mail Rds., FAS S 102-5 (1) and S-1040 (1), Franklin Co.;

Quigg Bros., 1500 Riverside St., Aberdeen, Wash., LB, $144,785, stockpiling crushed stone surf. and mineral aggregate Hys. 9-9-D and 13-A, Grays Harbor and Pacific Counties;

N. A. Degerstrom, E. 15 32 Ave., Spokane, Wash., LB, $179,656 bit. 2.936 mi. Hy. 3, Dragoon Creek to Denison FAP F 041-1 (6), Spokane Co. Bids Apr. 14. CD 4/1.

▲ General-Shea-Pacific-Kaiser, 2801 West Mission Road, Alhambra, Calif., LB, $8,669,733, Sch. 1, Donnells Dam appurtenant work; LB $7,525,885, Sch. 2, Donnell Tunnel and appurtenances; LB $1,322,986 Sch. 3, Donnells Power Plant and appurtenances. Will deduct 5.4 per cent from these totals if awarded all three Schedules;

Winston Bros. & Al Johnson Constr. Co., 1532 South California Ave., Monrovia, Calif., LB, $7,926,673 Sch. 4, Beardsley Dam Power Plant, After Bay Dam and appurtenances;

Morrison-Knudsen-Macco Corp.-River Constr. Corp., 319 Broadway, Boise, Idaho, LB, $6,548,252, Sch. 5, Tulloch Dam Power Plant and appurtenances;

John C. Gist, 2909 C St., Sacramento, Calif., LB $218,680, Sch. 6, Goodwin Dam and appurtenances, Tri-Dam Project, CALIFORNIA. Oakdale Irrigation District, 322 East D St., Oakdale, and South San Joaquin Irrigation Dist., 230 N. Main St., Manteca, Calif. Bids Apr. 16. CD 3/17.

BUILDINGS
LOW BIDS AND CONTRACTS

C. H. Elle Constr. Co., 390 Yellowstone Ave., Pocatello, Idaho, LB, $344,938, public school Green Acres; LB $342,148, public school, Lewis and Clark School, POCATELLO, IDAHO. Pocatello School District, Pocatello, Idaho. CD 2/24/50.

A. L. Gindling, 2960 Wilshire Blvd., Los Angeles, Calif., Owner Builds. $473,600, 64 stucco DWELLINGS, Bayla, Corby, Fallon, Milano and Tina Sts., NORWALK, CALIF. Southwest Drafting Service, 2724 W. Florence Ave., Los Angeles, archts.

▲ Centex Constr. Co. & Murchison Bros., 302 Land Title Bldg., San Diego, Calif., LB, $7,602,486 construct, manage and finance, 16 duplex units and 77 multiple family Military HOUSING Project N. 47, SAN DIEGO, CALIF. Eleventh Naval District, Pub. Wks. Bldg., San Diego, Calif. Bids Apr. 14. CD 3/23.

CANADA

HEAVY CONSTRUCTION
LOW BIDS AND CONTRACTS

Greenlees Constr. Ltd., 500 Beattie St., Vancouver, B. C., CA, $135,000, tanker loading dock;

Marwell Constr. Co. Ltd., 1500 W. Georgia St. Vancouver, B. C., CA, $400,000, constr. facilities, West-

(Continued on page 68)

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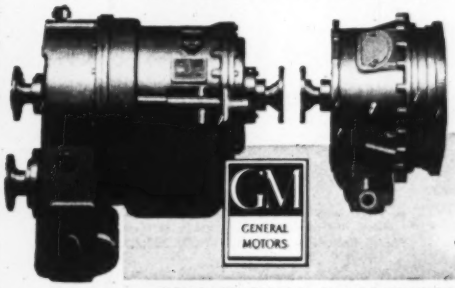

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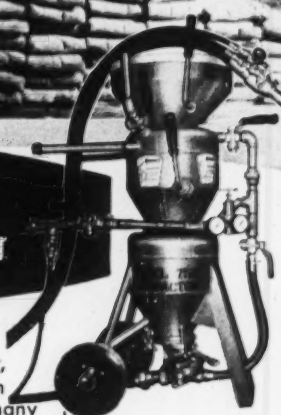

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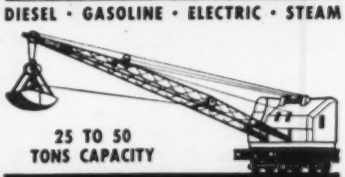

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(Continued from page 66)

ridge Terminal Westridge on Burrard Inlet, BRITISH COLUMBIA, Transmountain Oil Pipe Line Co. Ltd., c/o Bechtel Corp., 220 Bush St., San Francisco, Calif. Canadian Bechtel Co. Ltd., Bank of Nova Scotia Bldg., Toronto, Ont., engrs.

Loranger & Molesworth Ltd., 1097 St. Roch St., Three Rivers, Que., CA, $210,000, WW sys., 34,000 ft. 6 in. c.i. pipe and 18,000 ft. 8 in. and 21,500 ft. 10 in. pipe, THREE RIVERS, QUE. Municipality of Parish of Three Rivers, W. Isabel, secy., 507 Forges St., Three Rivers, Que. CD 9/12/52.

BUILDINGS

LOW BIDS AND CONTRACTS

W. G. Watkins Ltd., Elmvale, Ont., CA. $300,000, 72 x 241 ft., concrete, steel, brick SCHOOL, ELMVALE, ONT. High School Bd., Elmvale, Ont. Bids Feb. 23. CD 2/10.

▲ **Peter Ucci & Sons**, 61 Lyon Ave., Toronto, Ont., Owner Builds, $800,000, 80 suite apartment block Wellesley St. near Bay St.; $700,000 78 one and two bedroom suites, 5 story bsmnt., L-shaped 100 x 204 ft., apartment block Eglinton Ave. W. near Ennerdale Rd., TORONTO, ONT. Flanagan & Black, 2906 Bloor St. W., Toronto, Ont., engrs. and M. Sklar, 165 Spadina Ave., Toronto, Ont. archt.

Waterman-Waterbury Co. Ltd., Rose and Seventh Ave., Regina, Sask. CA $493,000, plumbing and heating for HOSPITAL, SASKATOON, SASK. Prov. Dpt. P. Wks., Regina, Sask. CD 4/13/51.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **U. S. Eng.**, Anchorage, Alaska, rejected bids Apr. 10, electrical distr. sys., Inv. 53-90, Ladd Air Force Base, ALASKA. LB $347,390. CD 4/16, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Peter Kiewit Sons' Co.**, 1300 Aloha St., Seattle, Wash., and **Fred J. Early, Jr. Co., Inc.**, 369 Pine St., San Francisco, Calif., LB $10,521,749, est. $11,850,000 802 barracks, shops, laboratory, warehouse, heat and power plant, for Arctic Training Branch and Arctic Indoctrination School, ENG-95-507-53-43, BIG DELTA, ALASKA. U. S. Eng., Evergreen Hall, 3013 Arcade Bldg., Seattle 1, Wash. Bids Apr. 14. CD 4/3.

Proposed Projects

WATER SUPPLY

▲ **Ga., Thomasville**—City, City Hall, plans by Reynolds, Smith & Hills, 227 Park St., Jacksonville, Fla., water and light plant imprvs. $2,225,000. CD 3/11.

O., Youngstown—Ohio Water Service Co., 235 State St., Struthers, Youngstown, modernize present 1 m. g. filter plant near Pittsburgh Rd., Poland, boosting capacity to 2 m. g., new feeder main extending to Evans Lake, several miles distr. pipe lines, $500,000. Burgess & Niple, 584 E. Broad St., Columbus, consult. engrs.

▲ **Okla., Oklahoma City**—City, City Hall, cancelled bond election of Apr. 28, shallow well water supply, $2,000,000. C. E. Bretz, 1916 N. Broadway, consult. engr. CD 3/10.

SEWERS, WASTE DISPOSAL

Ala., Ozark—City, City Hall, addnl. sanitary sewerage imprvs. $400,000. Ewin Eng. Corp., P. O. Box 361, Mobile, consult. engrs. CD 1/14.

▲ **Calif., Long Beach**—City, City Hall, voted bonds Apr. 3, incinerator, $1,305,000. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs., CD 2/6; storm drains, libraries, fire alarm sys., $3,000,000.

▲ **Calif., San Mateo**—City, City Hall, voted $1,420,000 bonds, sewerage sys., treatment plant and new fire stations CD 1/30.

Ga., Albany—City, City Hall, addnl. sanitary sewerage imprvs. $775,000. Weideman & Singleton, P.O. Box 1878, Atlanta, consult. engrs.

▲ **Md., Towson**—Comrs. Baltimore Co., Court House, Stemmers Run Pumping Station and force main; Orems Road pumping station and force main; Back River underwater crossing, $2,500,000, Rummel, Klepper & Kahl, 1021 N. Calvert St., Baltimore, consult. engrs. Chas. B. Wheeler, ch. engr.

▲ **Mich., Kalamazoo**—City, P. Wks. Dpt., voted $3,750,000 bonds, concrete sewage plant, treatment facilities. Jones, Henry & Schoormaker, Security Bldg., Toledo, O., consult. engrs. CD 3/3.

▲ **O., Toledo**—City, Arnold V. Finch, mgr., City Hall, secondary sewage treatment plant, $7,500,000-$8,000,000. Consoer Townsend & Assoc., 351 E. Ohio St., Chicago, Ill., consult. engrs. CD 10/8/51.

▲ **Tenn., Johnson City**—City, sewage disposal plant and sewer lines. $3,058,000. CD 1/3/47.

Tenn., Knoxville—City, City Hall, addnl. storm sewers. $500,000. CD 12/21/51.

Va., Covington—Town, voted bond Apr. 7, sewage plant, $725,000; water main extens., $60,000; sewer line extens., $120,000. CD 3/10.

▲ W. Va., St. Albans—City, City Hall, sewage disposal plant, interceptor sewers, terra cotta or transite, sewer extensions. $1,000,000. W. E. Kelley, 1204 Kanawha Blvd., Charleston, consult. engr. J. H. Milam, 1214 Myers Ave., Dunbar, engr. CD 8/11/50.

BRIDGES

▲ GEORGIA—Georgia State Toll Bridge Auth., 2 Capitol Square, Atlanta,
Camden Co.—bridge over Satilla River on Hy. 25, $1,400,000.
Floyd Co.—bridge over Oostanaula River in Rome, $1,200,000.
Houston and Twiggs Counties—bridge over Ocmulgee River on Hy. 27, $1,000,000.
Macon Co.—bridge over Flint River on Hy. 28, $900,000.
Tattnall and Appling Counties—bridge eover Altamaha River on Hy. 64, $650,000.
▲ OHIO—State Hy. Dpt., Columbus,
Jefferson Co.—Fort Steuben Bridge approach project, Steubenville. $2,800,000. CD 12/2/43.

STREETS AND ROADS

▲ Calif., Long Beach—City, City Hall, voted bonds Apr. 3, DeForest Ave. Hy. Proj. $4,000,000; imprv. approaches to Municipal Auditorium. $1,500,000. CD 2/6.
Ga., Columbus—City, City Hall, bond election June 10 street imprv. $600,000. CD 11/22/49.

EARTHWORK, WATERWAYS

▲† Wash., White Swan—Bureau Indian Affairs, Dpt. Interior, 19 and C Sts., Wash., 25, D. C., reservoir and irrigation canals. $5,600,000.
▲ Ontario—AuSable River Conservation Auth., C. E. Janes, M. L. A. chn. Advisory Bd., R.R. 2, Watford, deepening river channel, constr. 3 dams, develop park area in Pinery, constr. roads and reforesting, AuSable River Area, $1,850,000.

AIRPORTS

Calif., Hayward—City, City Hall, defeated $150,000 bonds, airport imprvs. CD 3/12.
▲ Calif., Long Beach—AIRPORT—City, City Hall, voted $3,500,000 bonds, airport imprvs. (3 hangars). CD 2/6.
† Ill., Rantoul—HOSPITAL—U. S. Eng., 475 Merchandise Mart, Chicago, Zone 54, plans by Schmidt, Garden & Erikson, consult. engrs. and archts., 104 S. Michigan Ave., Chicago, Zone 3, 200/300 bed hospital. Chanute Air Force Base. CD 6/28/51.
▲ † Md., Andrews Air Force Base—HOSPITAL—U. S. Eng., First and Douglas Sts. N. W., Wash., D. C., plans by York & Sawyer, 1308 18 St. N. W., Wash., D. C., concrete, steel, masonry hospital, $3,500,000. CD 10/31/51.
▲ O., Toledo—AIRPORT—City, City Hall, bond election May 19, express airport at Oak Openings. $3,500,000. Extended date. CD 4/8.
▲ Alta., Cold Lake—HANGAR—Dpt. National Defence AIR, Govt. of Canada, Administrative Offices, Ottawa, Ont., 3 story, 300x425 ft. hangar with cantilevered roof spanning out on both sides of a central concrete workshop, $3,000,000. Defence Constr. Ltd., 70 Lyon St., Ottawa, Ont., engr.
▲ Alta., Namao—HANGAR—Dpt. National Defence, Air, Govt. of Canada, Administration Office, Ottawa, Ont., hangar with cantilevered roof spanning out on both sides of central concrete workshop, 3 story high, 300x425 ft. around hangar doors 51 ft. high. $3,000,000. Defence Constr. Ltd., 70 Lyon St., Ottawa, Ont., engrs.
B. C., Comox—HANGAR, etc.—Dpt. National Defence AIR, Govt. of Canada, Administrative Offices, Ottawa, Ont., 3 story, 300x425 ft., hangar with cantilevered roof spanning out on both sides of a central concrete workshop. $3,500,000. Defence Constr. Ltd., 70 Lyon St., Ottawa, Ont., engr.
▲ N. S., Greenwood—HANGAR, etc.—Dpt. National Defence AIR, Govt. of Canada, Administrative Offices, Ottawa, Ont., hangar with a cantilever roof spanning out on both sides, of a central concrete workshop. $3,000,000. Defence Constr. Ltd., 70 Lyon St., Ottawa, Ont., engr.

PUBLIC BUILDINGS

▲ Ala., Tuscaloosa—TB BLDG., etc.—State, State Capitol, Montgomery, plans by Raymond Sizemore, 16 S. Hull St., Montgomery, TB bldg., $1,560,000; men's psychiatric bldg., $1,600,000; plans by Sherlock, Smith & Adams, 303 Washington Ave., Montgomery, men's ward $1,500,000; plans by Turner & Northington, Medical Arts Bldg., Florence, treatment bldg. for Negro men, $1,500,000; plans by Van Keuren Davis & Co. American Life Bldg., Birmingham, treatment bldg. for Negro women, $1,500,000; plans by Lawrence S. Whitten, Brown-Marx Bldg., Birmingham, women's psychiatric bldg. $1,500,000, all foregoing for Bryce State Hospital.
Calif., Downey—HIGH SCHOOL—Downey Unified School Dist., 8521 E. Firestone Blvd., plans by Clifford K. Denman & Harry T. MacDonald, 5749 S. Wilton Ave.,

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No man needed at the truck to guide the bucket that's TAG MASTER controlled. With this tag line pull (UNIFORM at all levels and adjustable to any job) you can turn, spin, snub or cast your clamshell direct from the cab. You get EXACT spotting, with a light drop that adds years to bucket life. In addition, the TAG MASTER can be used as a dipper trip. Send coupon now for more details of this combination tag line winder and dipper trip—and send it now.

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2. Less Swinging
3. Less Travel
4. Control of clamshell
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6. Increased performance
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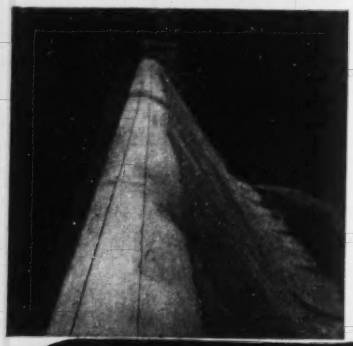

DAM REINTEGRATED WITH "GUNITE" BY CEMENT GUN CO.

Photograph above, left, shows Cement Gun Company crew preparing the spalled and disintegrated downstream side of a Virginia municipal hydro-electric dam for "Gunite." The "Gunite" was applied over reinforcing mesh to a depth of 2 inches greater than the original lines of the dam making the structure stronger and more durable than when it was originally built. To insure years of trouble-free service, "Gunite" was also applied on the up-stream side to eliminate seepage through the dam. The finished job is shown in photograph below, left.

Completely pictured and described in our latest catalog, are many instances of dam construction and repair together with many other types of "Gunite" jobs we have done. A request, on your letterhead, for Catalog A2400 will bring your copy by return mail.

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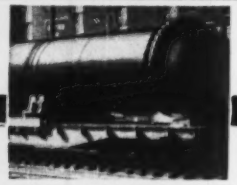

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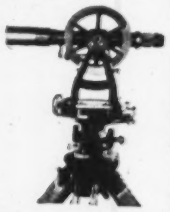

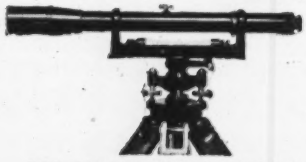

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Los Angeles, 1 story, 8 or 10 unit rigid steel frame East Junior High School. $800,000.

▲ Calif., Long Beach—CIVIC CENTER—City, City Hall, defeated $10,000,000 bonds Apr. 3, civic center. CD 2/6.

▲ Calif., Long Beach—HOSPITAL—City, City Hall, voted $16,382,000 bonds, hospital. CD 2/6.

Calif., Sanger—SCHOOL — City, City Hall, $850,000 bond election May 15, rehabilitation of high school, CD 3/28/46.

Conn., Southington—SCHOOL—Town School Bldg. Comm., South End Court, plans by Carl J. Malmfeldt & Assocs., 36 Pearl St., Hartford, brick, steel, concrete elementary school, $700,000.

Conn., West Hartford—SCHOOL—Town, P. School Dpt., 51 Memorial Rd., plans by Carl J. Malmfeldt & Assoc., 36 Pearl St., Hartford, modernize Whitman Elementary School. $500,000.

Ga., Buena Vista—SCHOOL—Marion Co. Bd. Educ., Buena Vista, White High School, $500,000.

Ga., Covington—HOSPITAL—Newton Co., plans by Aeck Assocs., 140 Peachtree St. N. E., Atlanta, hospital, $505,000. CD 10/14.

▲ Ga., Dalton—HOSPITAL—City and Whitfield Co., hospital. $1,250,000.

Ga., Folkston—SCHOOL—Charlton Co. Bd. Educ., Folkston, plans by Bothwell & Nash, 208 Roswell St., Marietta, high school, $542,000.

▲ † Ga., Macon—PLANT—District P. Wks. Office, Dpt. Navy, Charleston, S. C., plans by Stevens & Wilkinson, 157 Luckie St. N. W., Atlanta, inert mfg. plant, Naval Ordnance Plant, $2,800,000.

▲† Ga., Warner Robins—DEFENCE HOUSING UNITS—U. S. Federal Housing Admin., Peachtree & 7 Bldg. Atlanta, 375 defense housing units, $2,000,000.

Ga., Waycross—HOSPITAL—Ware Co., bond election May 5, hospital, $500,000. Gregson & Ellis, Mortgage Guarantee Bldg., Atlanta, archts. CD 10/13.

▲ Ga., Wrens—HOUSING—Wrens Housing Auth., Wrens, plans by John J. Harte Co., 284 Techwood Dr. N.W., Atlanta, 200 housing units, $1,500,000.

▲ Ia., Ames—LABORATORY—State Bd. Educ., State Office Bldg., Des Moines, veterinary diagnostic laboratory, Iowa State College, $600,000; barns and laboratory bldgs. for beef cattle and dairy cattle nutrition, $500,000, Iowa State College.

Ia., Cedar Falls—LABORATORY—Iowa State Bd. Educ., State Office Bldg., Des Moines, campus laboratory at Iowa State Teachers College, $500,000.

Ia., Iowa City—MEDICAL RESEARCH CENTER—State Bd. Educ., State Office Bldg., Des Moines, medical research center University of Iowa, $900,000.

Kan., Lindsburg—SCHOOL—Rural High School Dist. 4, McPherson Co., plans by Thomas & Harris, 321 W. 2 St., high school, $750,000. CD 2/21/52.

▲ Md., Baltimore—HOUSING—Baltimore Housing Auth., 709 E. Eager St., plans by Gaudreau & Gaudreau, 330 N. Charles St., Freemont Housing, 680 brick, block, steel units. $6,250,000. CD 5/21/45.

Mass., East Longmeadow—SCHOOL—Town, H. A. Truell, supt. schools, Hanward Hill, elementary school, Birchland Ave. $800,000.

▲ Mass., North Adams—DORMITORY—State, Dpt. Educ., J. J. Desmond, comr., 200 Newbury St., Boston, brick, steel dormitory, State Teachers College, $1,250,000.

Mich., Dearborn—YOUTH—City, Myron A. Stevens, clk., brick, steel youth bldg. incl. recreation facilities, etc. $700,000.

▲ Mich., Flint—MUNICIPAL BLDGS.—City, Robert G. Loeffler, city clk., defeated bonds municipal bldgs., city hall, bldg. to house police, fire and health dpts., $4,500,000; maintenance and storage garage for city vehicles, $700,000. CD 2/5.

▲ Miss., Clarksdale—PLANT—City, voted $1,750,000 bonds, plant for American Hardware Corp. CD 3/23.

▲ Mo., University City (St. Louis 5 P. O.)—SCHOOL—School Dist. of University City, Bd. Educ., Dr. Julius E. Warren, supt. Schools, 6701 Delmar Blvd., Zone 5, voted $2,225,000 bonds Apr. 7, Junior High School, school imprvs. Wm. B. Ittner, Inc., 408 Bd. Educ. Bldg., 911 Locust St., St. Louis, Zone 1, engr.-archt. CD 3/9.

O., Bexley—SCHOOLS—Bd. Educ., E. D. Jarvis, supt., Bexley, bond election May 5, schools, 2 story wing at Cassingham and remodel; wing at Montrose School; 2 story wing at high school, remodel stadium; new equip. $750,000. CD 2/11.

O., Brooklyn—SCHOOL—Bd. Educ., 9700 Biddulph Rd., Cleveland, Zone 9, voted bonds Apr. 7, build 24-room elementary school and remodel high school. $965,000. CD 1/27.

▲ O., Massillon—SCHOOLS—Bd. Educ., Massillon, 2 mill levy election May 5, school expansion program, new schools in Franklin, Lincoln and West Side Districts addns. to York and Whittier Schools, vocational shops expanded at Washington High School, $3,600,000. CD 11/25/49.

▲ O., Troy—LIGHT PLANT—City, imprv. municipal light plant, incl. new boiler, stoker, steel stack, coal conveyor, building and power piper and accessories. $1,000,000.

S. C., Lancaster—SCHOOL—Lancaster Co. Bd. Educ., Lancaster, Barr Street Negro School. $566,000

S. D., Pierre—OFFICE—State of South Dakota, Pierre, office bldg. for State Hy. Dpt. $800,000. D. W. Lowks, c/o owner, state engr.

Tenn., Franklin—HOUSING—Franklin Housing Auth., Franklin, plans by Steinbaugh & Wheeler, Presbyterian Bldg., Nashville, housing units. $800,000. CD 3/2.

(Continued on page 73)

Some new thinking on DENSITY *in* ASPHALT ROAD CONSTRUCTION

IN view of the fact that density under a screed or tamper varies with the thickness of material above the high or low spots in the subgrade, and in the presence of large stones in the mix, any approach to securing absolute uniformity in the thickness of a road from subgrade to surface would be an approach to uniformity in density. Obviously uniform thickness is the result of accuracy in grading and accuracy in spreading.

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The Adnun with the Fluid Level is not just a Black Top Paver! Not just a Material Spreader! With the Fluid Level the Adnun is a complete Road Builder! The Fluid Level makes it possible to begin with your properly graded subgrade and lay the base course of any material to an absolute plane the full width and length of the road. Successive courses of asphalt will be equally uniform. With uniformity of thickness in each successive course from subgrade to surface you have an approach to uniformity in density never before possible.

The Fluid Level takes out the dips that won't show under a straight edge. It brings long wheelbase results to an already compact, easily portable unit. It makes possible greater surface smoothness that results in better drainage and reduced breakdown. The possibility of holding error to within one or two percent, means less waste of material and cuts costs to the taxpayer and the loss for the contractor. Investigate this method of building roads. It brings you a long sought answer to better built, lower cost roads that will go far toward meeting today's traffic problems.

Ask for the booklet, "Put A Level On Your Roads", for more details.

This little booklet entitled, "Put A Level On Your Roads", tells you all about the Fluid Level. If you haven't seen it, send for it.

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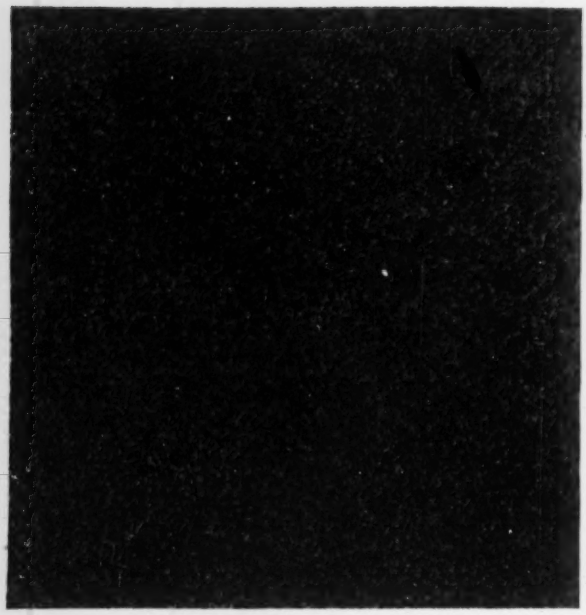
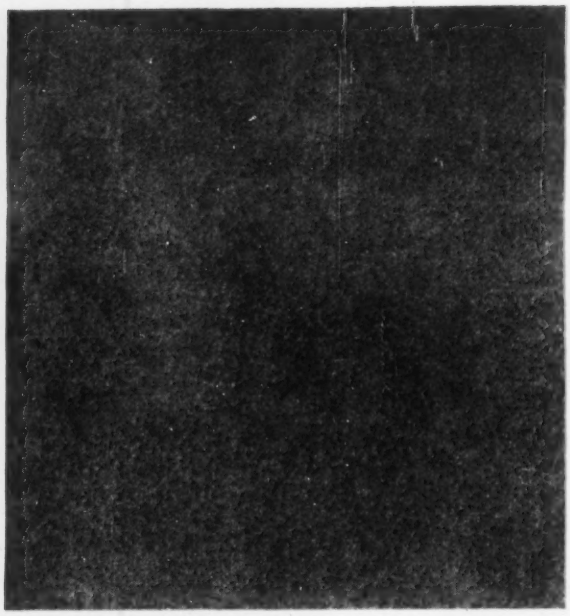


When plain carbon steel is exposed to the atmosphere, it begins to oxidize almost immediately and a layer of rust forms over the surface. After a brief period this rust has a tendency to curl up and flake off, leaving the metal exposed to further corrosive action.



Corrosion also takes place when Mayari R is exposed to the atmosphere. But the rust is different. Instead of flaking, it forms a thin, tight coating that holds securely to the surface and retards further corrosion of the metal beneath. And this in turn means longer life for Mayari R.

Why Mayari R Has Longer Life than Plain Carbon Steel

Tests conducted over a 10-year period show that Mayari R has 5 to 6 times as much resistance to atmospheric corrosion as plain carbon steel—and 2 to 4 times as much as copper-bearing steel.

During the first year of exposure under these tests, each of these three metals lost practically the same amount of weight through corrosion. But following that initial loss, the corrosion of the Mayari R gradually slowed down. After a few years it appeared to stop altogether. The plain carbon steel and the copper-bearing steel, on the other hand, continued to rust away and lose weight year after year, with practically no decrease in the rate of corrosion.

Mayari R has other advantages. It has better abrasion-resistance, higher yield point, and greater tensile strength than ordinary steel. These properties all contribute to improved design and longer life of equipment and structures.

You can get further information about Mayari R low-alloy, high-strength steel by writing to any of our sales offices for Catalog 259.

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Mayari R *makes it lighter... stronger... longer lasting*

(Continued from page 70)

Tenn., Waverly—HOUSING—Waverly Housing Auth., Waverly, plans by Steinbaugh & Wheeler, Presbyterian Bldg., Nashville, housing units. $500,000. CD 7/18.

Tex., Houston—COURT HOUSE—Harris Co., Court House, addnl. unit of court house. $750,000.

▲ Va., Blacksburg—LIBRARY—Virginia Polytechnic Institute, Blacksburg, library, $2,000,000. CD 6/3.

▲ Va., Chesterfield—SCHOOLS—Chesterfield Co. School Bd., Chesterfield, voted $3,000,000 bonds Apr. 7, school constr. E. S. H. Green, c/o owner, supt. Schools. CD 3/2.

▲ W. Va., Charleston—SCHOOLS—Bd. Educ. Kanawha Co., Elizabeth and Quarrier Sts., plans by Tucker & Hancock, Atlas Bldg., Proj. 32, brick, concrete, Cedar Grove Junior High School, Cedar Grove, $650,000; plans by C. E. Silling & Assoc., Masonic Bldg., Proj. No. 4—Dunbar Senior High School, $700,000; plans by Montgomery & Patteson, Bank of Commerce Bldg., Proj. 2, brick concrete Spring Hill Junior High School, $500,000. CD 12/3/51.

▲ Alaska, Anchorage—GYMNASIUM—School Bd., Anchorage, high school gymnasium in Spenard area. $2,500,000. CD 5/11/51.

▲ Man., Winnipeg—HOSPITAL—Misericordia Hospital Bd., Cornish Ave., plans by Northwood, Chivers, Chivers & Casey, Nanton Bldg., 10 story hospital addn. $2,500,000; 6 story nurses home with swimming pool, $1,000,000. CD 1/15.

▲ Ont., London—HOUSES—London and Suburban Planning Bd., A. Y. Barker, secy., 100 houses in Huron-Highbury area, northeast section of city. $1,000,000.

Que., Hull—SCHOOL—School Comn., Hull, plans by L. Sarra-Bournet, 189 Principale St., 2 story, concrete, brick, L-shaped Ecole Reboul. $700,000.

▲ Que., St. Laurent—BUILDING—Govt. of Canada, National Film Bd., Hunter Bldg., Ottawa, Ont., steel, concrete, brick, stone building, $5,000,000 voted. Ross, Patterson & Assoc., Dominion Square Bldg., Montreal, archts. Dept. P. Wks., Hunter Bldg., Ottawa, Ont., engrs. CD 9/22.

COMMERCIAL BUILDINGS

Calif., Beverly Hills—OFFICE—William Morris Agency, Inc., 202 N. Canon Dr., plans by Douglas Honnold & John Rex, 306 N. Doheny Dr., Los Angeles, 4 story office. $800,000.

Calif., Van Nuys—DWELLINGS—Van Owen Estates, 6338 Wilshire Blvd., Los Angeles, 100 frame stucco dwellings, Haitland, Comanche, Winnetka and other streets. $900,000.

Fla., Miami Beach—HOTEL—Louis Plaks, 50 N. W. 14 St., Maimi, plans by Igor B. Polevitzky, 250 N. E. 18 St., Miami, hotel addn. $500,000.

▲ Ga., Atlanta—HOTEL—Ansley Hotel, Forsyth St., plans by Alexander & Rothschild, 316 Peachtree St. N. E., hotel addn. Approx. $1,000,000. CD 1/30.

▲ Ga., Atlanta—SHOPPING CENTER—Dogwood Village, Inc., c/o W. F. Penney, archt., 732 Boulevard, N.E., shopping center. $2,200,000.

Ga., Columbus—OFFICE—Southern Bell Telephone Co., Hurt Bldg., Atlanta, plans by Armistread & Saggus, Candler Bldg., Atlanta, office addn. $650,000.

▲ Ga., Decatur—RESIDENCES—T. J. Northcutt & Co., c/o Heery & Heery, archts., 1722 Peachtree St., N. W., Atlanta, 100 residences. $1,600,000.

▲ Ga., Savannah—SHOPPING CENTER—B. B. Eicholz, c/o Levy & Kiley, archts., Realty Bldg., shopping center. $1,000,000.

Kan., Wichita—HOSPITAL—Wesley Hospital, 550 N. Hillside St., plans by Forsblom & Parks, Beacon Bldg., hospital addn. $2,500,000.

Md., Laurel—TELEPHONE—Chesapeake & Potomac Telephone Co., 320 St. Paul Pl., Baltimore, plans by Taylor & Fisher, 1012 N. Calvert St., Baltimore, steel, concrete, masonry central telephone bldg. $800,000.

Mass., Newton—ACADEMIC—Newton College of Sacred Heart, 885 Center St., plans by Maginnis & Walsh, 126 Newbury St., Boston, academic bldg. addn., $900,000.

Mass., Roxbury—HOSPITAL—Jewish Memorial Hospital, 45 Townsend St., plans by Herman L. Freer & William E. Nast, 27 School St., Boston, 3 story, 60x130 ft. hospital addn., Townsend St. $600,000. Abraham Woolf, 27 School St., Boston, consult. engr. CD 8/23/50.

Mass., Saugus—SHOPPING CENTER—Milton G. Green & Allen J. Green, 1368 Beacon St., shopping center west side Newburyport Turnpike, 164 acres, parking space for 4,000-cars. $500,000.

▲ Mich., Grand Rapids—COLLEGE BLDGS.—Aquinas College, A. F. Bukowski, pres., 1607 Robinson Rd. S.E., plans by D. A. Bohlen & Son, State Life Bldg., Indianapolis, Ind., brick, steel, concrete college bldgs. incl. 20-room classroom structure, offices, science unit, admin. bldg. $1,250,000.

Minn., Minneapolis—CHURCH.—St. Olaf's University R. C. Church, Rev. L. P. Cowley, Second Ave. S. and 8 St., plans by Thorshov & Cerney, 400 Metropolitan Bldg., church, Second Ave. S. and 8 St. $600,000.

▲ N. Y., Yonkers—APARTMENT—Roann Building Corp., c/o Morris Rothstein & Son, archts., 186 Joralemon St., Brooklyn, Zone 2, apartment project, incl. eight 6 story bldgs. for 384 families, Midland and Kimball Aves. $4,000,000.

▲ O., Maumee—SHOPPING CENTER—Arthur E. Schroeder, Toledo Trust Bldg., Toledo, shopping center, on 15-acre site, Anthony Wayne Trail and Detroit Ave., 900-car parking lot. $2,000,000.

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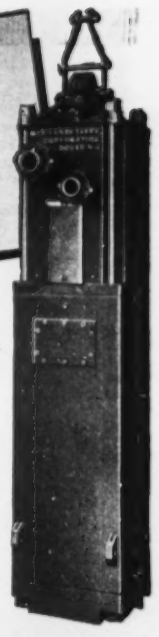

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▲ **Pa., McKeesport**—HOSPITAL—McKeesport Hospital, 1500 Fifth Ave., plans by Harry J. Seeley, 55 Hazel Dr., Mt. Lebanon, Pittsburgh, 7 story, brick, steel general hospital. $3,000,000.

Pa., McKees Rocks—NURSES HOME and SCHOOL—Ohio Valley General Hospital, Heckle Rd., plans by Press C. Dowler, Century Bldg., Pittsburgh, 4 story brick, block nurses home and school. $700,000. CD 11/29/48.

▲ **Tenn., Knoxville**—CHURCH—Bell Ave. Baptist Church, 1900 McCalla Ave., church. $1,000,000.

▲ **Tenn., Memphis**—OFFICE—Southern Bell Telephone Co., Hurt Bldg., Atlanta, Ga., Moss Road Dial office. $1,337,000.

▲ **Tex., Dallas**—OFFICE—Corrigan Properties, Inc., Mercantile Bank Bldg., plans by Wyatt C. Hedrick, archt.-engr., Box 5055, 50 story office. $18,000,000. CD 1/14.

▲ **Tex., Tyler**—OFFICE—Cotton Belt Route (St. Louis Southwestern Ry. Co.) W. H. Hudson, Jr., ch. engr., Tyler, plans by Wyatt C. Hedrick Co., 1005 First Natl. Bank Bldg., Fort Worth, 2 story, bsmnt., 200x250 ft. rein.-con. frame, face brick, stone trim office. $1,250,000. CD 2/11.

▲ **Va., Alexandria**—NURSES HOME—Alexandria Hospital, 709 Duke St., plans by Joseph Saunders, 121 S. Columbus St., expansion program, incl. nurses home, $2,900,000.

Wash., Spokane—DORMITORY, etc.—Gonzaga University, E. 502 Boone St., dormitory and cafeteria buildings. $900,000.

Alta., Edmonton—OFFICE—Anglo-American Exploration Ltd., c/o Rule, Wynn & Rule, archts., 513 8 Ave. W., conversion of 2 bldgs. on 9 Ave. between 2 and 3 Sts., into 6 story bsmnt., granite base, stone office bldg. $750,000.

Alta., Edmonton—APARTMENT—Paramount Development Corp., c/o Peter Capari, archt., 496 Church St., Toronto, Ont., and A. O. Minsos, archt., McCoshom Bldg., 7 story, 54x187 ft. 86 suite rein.-con. apartment, service shops and restaurant, Jasper Ave. and 110 St. $900,000.

Que., Montreal—APARTMENT—Reich & Zeisler, 2135 Van Horne Ave., plans by G. Shubin, 4326 Sherbrooke St. W., 5 story, brick, concrete terra-cotta apartment, Northcrest Plaza. $750,000.

INDUSTRIAL BUILDINGS

▲ **Colo., Johnstown**—PLANT—Great Western Sugar Co., Sugar Bldg., 1530 16 St., Denver, monosodium glutamate plant. $2,500,000.

Ga., Atlanta—PLANT—Scripto, Inc., 423 Houston St. N.E., plant addn. $500,000.

▲ **La., Meraux**—REFINERY—Ingram Products Co., 6301 Centennial Bldg., Nashville, Tenn., remodel, expand oil refinery, $4,000,000.

▲ **Miss., Columbus**—PLANT—American Bosch Co., 3664 Main St., Springfield, Mass., plant. $1,000,000.

▲ **Tex., Springtown**—PLANT—Lone Star Gas Co., 1915 Wood St., Dallas, gasoline plant, near Weatherford. $2,250,000.

▲ **Wash., Seattle**—PARKING GARAGE—System Auto Parks & Garages, Inc., 601 Olive Way, 6-level parking garage. $3,000,000.

Ont., Malton—PLANT—A. V. Roe Canada Ltd., Malton, plant expansion, incl. 3 buildings, office and gas turbine experimental section remodelling, etc. $600,000. Ewart, Armer & Byam, 2453 Bloor St. W., Toronto, consult. engrs. CD 2/27.

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▲ **Calif., Long Beach**—PARK IMPRVS., etc.—City, City Hall, voted bonds Apr. 3, park imprvs., $6,750,000; development of marine yacht harbor at Alamitos Bay, $10,000,000. CD 2/6.

▲ **Calif., Redwood City**—HARBOR CHANNEL IMPRVS.—City, City Hall, defeated $1,000,000 bonds harbor channel imprvs. CD 2/17.

Fla., Quincy—GAS SYSTEM—City, natural gas distr. sys. $500,000.

▲ **Ga., Albany**—GAS SYSTEM—City, natural gas distr. sys. $1,000,000.

Ga., Americus—GAS SYSTEM—City, natural gas distr. sys. $750,000.

Ga., Bainbridge—GAS SYSTEM—City, natural gas distr. sys. $750,000.

Ga., Cairo—GAS SYSTEM—City, natural gas distr. sys. $600,000.

Ga., Camilla—GAS SYSTEM—City, natural gas distr. sys. $600,000.

Ga., Cartersville—GAS SYSTEM—City, natural gas distr. sys. $800,000.

▲ **Ga., Cordele**—GAS SYSTEM—City, natural gas distr. sys. $550,000; natural gas distr. sys. $575,000.

▲ **Ga., Moultrie**—GAS SYSTEM—City, natural gas distr. sys. $1,000,000.

Ga., Pelham—GAS SYSTEM—City, natural gas distr. sys. $700,000.

Ga., Thomasville—GAS SYSTEM—City, natural gas distr. sys. $900,000.

▲ **Me., Bar Harbor**—FERRY TERMINAL—Bar Harbor Ferry Comm., Jos. Edgan, chn., Everett Gerrish, town mgr., Bar Harbor, ferry terminal. $1,275,000.

▲ **N. J., Hoboken**—PIER—Port of New York Auth., 111 Eighth Ave., New York, 11, N. Y., first stage construction Pier C, 660x345 ft. opposite First St., also rehabilitating existing structures, $8,276,000 authorized. CD 5/16.

▲ **North Carolina**—PETROLEUM LINES—Plantation Pipe Line Co., 161 Spring St. N.W., Atlanta, Ga., 82 mi. petroleum transmission lines, Charlotte to Greensboro. $4,500,000.

▲ **Okla., Tahlequah**—GAS SYSTEM—City, cancelled bond election of Apr. 7, natural gas sys. $1,200,000. L. S. Martenson, c/o owner, engr. CD 3/17.

Pa., Mayview—ELECTRICAL SYSTEM, etc.—General State Auth., 18 and Herr Sts., Harrisburg, repairs to electrical distr. sys., $400,000; constr. steam distr. tunnels and piping changes, $425,000, at Mayview State Hospital. A. F. Jones, c/o owner, ch. engr.

▲ **R. I., Providence**—RAILROAD STATION and TRACKS—New York, New Haven & Hartford R. R. Co., T. P. Polson, ch. engr., 54 Meadow St., New Haven 6, Conn., relocating railroad station, new station to be built off Promenade St., west of the Brown & Sharpe Mfg. Co. property; main line tracks along shortest line by viaduct and tunnel from Balbo Ave. to Charles St. through Smith Hill, $18,000,000. Praeger Maguire, 142 Richmond St., Providence, R. I., and 126 E. 38 St., New York 16, N. Y., consult. engr.

Tenn., Henderson—GAS SYSTEM—City, natural gas distr. sys. $610,000.

▲ **T. H., Honolulu**—TUNNEL—City, City Hall, Kalihi Hy. Tunnel. $3,500,000. Law & Wilson, Honolulu, consult. engrs.

N. B., Saint John—TELEVISION STATION—New Brunswick Broadcasting Co. Ltd., 14 Church St., television station, $600,000.

N. S., Sydney—TELEVISION STATION—Cape Breton Broadcasters Ltd., Charlotte St., television station, $600,000.

Ont., Hamilton—TELEVISION STATION—CHML, CKOC and CJSH, 848 Main St. E., television station, $600,000.

Ont., Sudbury—TELEVISION STATION—CKSO, Sudbury, television station, $500,000.

Ont., Windsor—TELEVISION STATION—CKLW, Windsor, TV station, $600,000.

Que., Three Rivers—TELEVISION STATION—Trans-Canada Telemeter, City Hall, television station, etc., $500,000.

Que., Ville St. Georges—TELEVISION-RADIO STATION—Radio Beauce, Inc., Ville St. Georges, television-radio station, $500,000.

▲ **Saskatchewan and Manitoba**—OIL PIPE LINE—Interprovincial Pipe Line Co. Ltd., 50 King St. W., Toronto, Ont., oil pipe line loop in western Canada between Regina, Sask. and Gretna, Man. $9,000,000.

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HYATT ROLLER BEARINGS

UNIT PRICES

Parkway bridge, New Jersey

A superstructure bid 33% below the engineers' estimate and superstructure bid 8% below were received by the New Jersey Highway Authority on February 19 for the 4,385-ft steel girder, Raritan River Bridge, Garden State Parkway.

Parsons, Brinckerhoff, Hall & MacDonald, and Dr. D. B. Steinman are the engineers.

The substructure includes the south abutment and six land piers on the south side and the north abutment and eleven land piers on the north. The superstructure consists of three continuous three-span steel girders with two 30-ft wide roadways and provisions for a third if necessary.

Structural ironworkers are receiving $3.54 per hr; cement finishers, $3.35 per hr; and laborers $2.05 per hr.

Bidders include:

Land piers & abutments

1C Poirier & McClane Corp., N. Y., N. Y. $1,195,385
2 Spearin, Preston & Burroughs, Inc., N. Y., N. Y. 1,282,695
3 Chas. F. Vachris, Inc., Brooklyn, N. Y. 1,370,730
EE Parsons, Brinckerhoff, Hall & Macdonald, N. Y., N. Y. Dr. D. B. Steinman, New York, N. Y. 1,774,235

Bids: 1-19-53 Item	Unit	Quantity	Unit Prices 1C	2
Prot of RR traffic	ls	1	$1,000	$2,000
Final cleaning up	ls	1	1,500	2,000
Found exc at piers 1-6 inc. ex piers 1-6 inc	cy	13,650	11.00	8.00
	cy	11,800	6.00	2.80
Class "B" concrete	cy	3,690	25.00	25.00
Class "C" concrete	cy	19,300	29.40	35.00
Class "D" concrete	cy	73	35.00	125.00
Reinf stl in structures	lb	1,333,000	0.05	0.06
Structural steel	lb	526,000	0.03	0.02
Cast-in-place conc piles	lf	42,100	5.00	6.00
Stl bearing piles	lf	6,800	2.00	2.00
Splices for stl piles	ea	10	65.00	100.00
8" perf corr metal pipe	lf	210	5.00	8.00
12" corr metal pipe	lf	20	5.00	10.00

Superstructure

1C Bethlehem Steel Corp., Bethlehem, Pa. $4,865,414
2 U. S. Steel Corp., N. Y., N. Y. 4,996,994
EE Parsons, Brinckerhoff, Hall & MacDonald, N. Y., N. Y. Dr. D. B. Steinman, N. Y. N. Y. 5,282,542

Bids: 2-19-53				
Str stl, floor system	lb	8,515,000	$0.224	$0.2347
Str stl, girders bracing	lb	10,394,000	0.223	0.2371
Sidewalk & mall grating	sf	28,350	7.50	7.82
Bridge railing	lf	8,773	23.00	22.74
Cast steel bearings	lb	226,200	0.52	0.48
Prot of RR traffic	ls	1	4,000	4,100

Trunk & interceptor sewers, Augusta, Georgia

Work has begun on a $158,222 sewer job awarded by the city of Augusta to Kahn & Jackson, Columbia, S. C., the lowest of four bidders. Patchen & Zimmerman, Augusta are the engineers.

The project consists of laying 9,550 lin ft of 18 in. diameter sanitary trunk sewer for the Rock Creek Trunk Sewer and 2,830 lin ft of 30 in. sanitary sewer for the Lakemont-Grace Street interceptor sewer.

Carpenters, are receiving $2.13 per hr; and pipelayers, $1.15 per hr. Bidders include:

1C Kahn & Jackson, Inc., Columbia, S. C. 158,222
2 Southern Roadbuilders, Augusta, Ga. 168,731
4 C. Y. Tomason Co., Greenwood, S. C. 315,508
EE Patchen & Zimmerman, engineers, Augusta, Ga. 157,075

Bids: 1-16-53 Item	Unit	Quantity	Unit Prices 1C	2
18" conc sewer pipe, 0'-8' cut	lf	932	$4.35	$4.60
8'-8' cut	lf	1,576	4.65	4.85
8'-10' cut	lf	1,841	5.15	5.80
10'-12' cut	lf	1,715	5.70	6.55
18" RC sewer pipe, 10'-12' cut	lf	91	6.80	6.95
12'-14' cut	lf	1,000	8.00	8.95
14'-16' cut	lf	351	9.00	11.35
16'-18' cut	lf	78	12.00	15.85
18" AC sewer pipe, 8'-10' cut	lf	148	9.90	11.80
10'-12' cut	lf	88	10.45	13.00
12'-14' cut	lf	336	11.55	15.25
14'-16' cut	lf	1,242	13.45	17.00
16'-18' cut	lf	45	16.45	18.75
18'-20' cut	lf	23	20.00	23.50
20'-22' cut	lf	29	25.00	24.00
24" RC sewer pipe, 18'-20' cut	lf	3	27.00	35.00
30" RC sewer pipe, 6'-8' cut	lf	333	9.10	10.90
8'-10' cut	lf	437	12.00	12.90
10'-12' cut	lf	476	13.50	14.65
12'-14' cut	lf	100	20.00	17.20
14'-16' cut	lf	285	20.00	20.00
16'-18' cut	lf	834	24.00	23.25
18'-20' cut	lf	221	30.00	28.70
20'-22' cut	lf	148	40.00	29.40
Std sewer manhole	vf	486	32.00	25.00
Extra for drop in MH	vf	6	20.00	20.00
Std MH frame & cover, in place	ea	29	35.00	35.00
Special MH frame & cover, bolted	ea	12	140.00	150.00
Conc cradles & encasement	cy	28	35.00	40.00
Reinf conc collars	cy	1	80.00	75.00
Remove & replace bit pavement	sy	1,000	3.50	3.50
Refill replacing rock & unstable material	cy	250	4.00	4.50
Sheeting, bracing, left in place	mfmb	10	200.00	85.00
Connect to exist sewer @ sta 0+00, incl MH #1	ls	1	450.00	850.00
18" sewer crossing under spillway, sta 45-B to sta 45+65 incl encasement, etc	ls	1	885.00	3,000
18" sewer on piers	ls	1	4,098	3,940
18" sewer crossing under RR	ls	1	1,830	1,500
18"x6" conc wye branches	ea	76	12.00	16.50
Rock exc in trench	cy	1,000	3.00	5.00
6" plugs installed in wyes	ea	54	1.00	0.50

Access roads, Florida

A $209,939 contract has been awarded to Troup Bros., Inc., Miami, lowest of eight bidders for construction of access roads on Virginia Key, Miami, extending from Rickenbacker causeway to the site of a proposed sewage treatment plant. The low bid was 8% below the second low and 30% below the high bid. Metcalf & Eddy and Rader Engineering Co., Boston were the engineers. Bidders include:

1C Troup Bros., Inc., Miami, Florida $209,939*
2 W. T. Price Dredging Co., Miami, Florida 227,436*
8 H. M. Engelhart, Coral Gables, Florida 300,682*

Bids: 2-19-53 Item	Unit	Quantity	Unit Prices 1C	2
(1) Clearing & grubbing	ls	21	$9,575	$5,000
(2) Borrow excavation	cy	322,000	0.45	0.525
(3) 12" pit rock rdwy, double crse, bit seal coat	sy	31,500	1.44	1.32
(4A) 8" pit rock base	sy	190	0.95	1.00
(4B) Slag surface	sy	340	0.48	0.40
(4B, alt) crush stone surface	sy	340	0.40	0.35
(5) Rip rap surface	sy	350	8.00	4.00
(6) 48" RC culv pipe	lf	320	33.00	25.00
(6A) 72" x 44" CMP arch	lf	240	29.00	42.00

* Combining item 6A with item 4B

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Contractor: C. Y. Thomason Co.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
May 5 Massachusetts

▲† **Me., Limestone**—MAINTENANCE HANGAR—B.A. About 5/27—U. S. Eng., 857 Commonwealth Ave., Boston 15, Mass., double cantilever maintenance hangar, Limestone Air Force Base, Eng. 19-016-53-104. Under $5,000,000. CD 4/16/52, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Gilbane Building Co.**, 90 Calverly St., Providence, R. I. CA **$5,812,315**, est. $6,000,000. constr. ammunition storage facilities, Westover Air Force Base, CHICOPEE FALLS, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 1/14/52.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Wexler Constr. Co.**, 118 Needham St., Newton, Mass., LB, **$1,948,000**, MR-4B, 160-unit moderate rental HOUSING, NEW LONDON, CONN. City, New London Housing Auth., 97 Laurel Dr., New London, Conn. Bids Apr. 21. CD 3/24.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
May 12 Maryland
STREETS AND ROADS
May 7, 11 New Jersey May 8 Pennsylvania

▲† **Del., Dover**—HEATING PLANT, etc.—B.A. 5/20—U. S. Eng., 121 N. Broad St., Phila., Pa., central heating plant and distr. system, Dover Air Force Base, ENG-36-109-53-424. $1,000,000 Extended date. Whiteside, Foster, Damon & Doane, Inc., du Pont Bldg., Wilmington, Del., engrs. and archts. CD 4/13.

BIDS ASKED—BUILDINGS

▲ **Pa., Morrisville**—CHURCH, etc.—B.A. About 5/15—St. Michael the Archangel R. C. Church, 1025 Radcliffe Rd., Bristol, church, admin. bldg., high school, parochial school, convent, rectory and parking lot, Levittown, $3,500,000. James A. Nolen, Jr., 1649 N. Broad St., Phila., Pa., archt. CD 2/5.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW JERSEY**—N. J. Hy. Auth., State Hy. Office Bldg. 1035 Parkway Ave., Trenton,
Villa Contg. Co., Inc., 233 North Ave., Westfield, N. J., CA, **$1,725,575**, Contract No. 4, grading, drainage and paving for Section 7, Garden State Parkway from Route 66 to Pine Brook Rd., New Shrewsbury, Mommouth Co. Bids Mar. 26, awarded Apr. 16 CD 3/31, under LB.

▲† **Malan Constr. Co., Inc.**, 25-09-42 Road, Long Island City, N. Y., LB, **$1,824,312**, AVGAS fuel and lube facilities, McGuire Air Force Base, ENG-36-109-53-367, WRIGHTSTOWN, N. J. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids Feb. 10. CD 2/19, under LB.

▲ **Bass Eng. & Constr. Co.**, 215 Birmingham Theatre Bldg., Birmingham, Mich., LB **$1,106,880**, West Sewage and Waste Treatment Plant and intercepting sewers; LB **$1,607,510**, Central Sewage Treatment Plant and intercepting sewers, WILLIAMSPORT, PA. Williamsport Sanitary Auth., 253 W. 4th St., Williamsport, Pa. Chester Engineers, 210 E. Parkway, Pittsburgh, Pa., engrs. Bids Apr. 15. CD 4/8.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Psaty & Fuhrman, Inc.**, 369 Lexington Ave., New York 17, N. Y., CA, **$3,000,000** 19 story OFFICE, 555 Fifth Ave., NEW YORK, N. Y. Fifth Ave. and 46 St., c/o Emery, Roth & Sons, archts., 575 Madison Ave., New York 22, N. Y.

▲ **C. DiFelice**, 24 N. Merion Ave., Bryn Mawr, Pa. Separate Contracts. **$3,750,000**. RESIDENTIAL DEVELOPMENT, King of Prussia Rd., KING OF PRUSSIA, PA.

▲ **Henry Berman**, 6032 Market St., Phila., Pa., Separate Contracts. **$3,800,000**. RESIDENTIAL DEVELOPMENT, Elmwood Ave., PHILA., PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

SOUTH

BIDS ASKED—BUILDINGS

▲ **Va., Alexandria**—PLANT—B.A. 5/6—Melpar, Inc., 452 Swann Ave. (selected list of bidders) research plant. $3,000,000. Perry M. Duncan, 121 E. 54 St., New York, N. Y., archt. CD 1/13.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **LOUISIANA**—State Hy. Dpt., Highway Office Bldg., Baton Rouge,
T. L. James & Co., Inc., Ruston, La., LB **$1,991,046**, grading, concrete slab span bridges, c.conc. 11.92 mi. Sorrento-Gramercy Hy., State Rte. 1500, S.P. 7-06-07 and 7-05-07, Ascension and St. James Parishes; LB **$526,028**; patching, wid'n. existing c.conc. surf. with bit. wearing course 12.58 mi. Adeline-Ce terville Hy., State Rte. 2, S.P. 4-06-06 and 4-07-05, St. Mary Parish;
Richard Coco, Mansura, La., LB **$68,321**, shaping roadway, bit. surf. tr. 3.85 mi. Dupont-Plaucheville Hy., State Rte. 92, S.P. 147-03-06, Avoyelles Parish;
Henry & Hall, Dubach, La., LB **$106,895**, shaping roadway, bit. surf. tr. 7.502 mi. Terrills-Farmersville Hy., State Rte. 15, S.P. 153-03-05, Union Parish;
L. M. Winford, Minden, La., LB **$91,338**, shaping roadway, bit. surf. tr. (asph. cement) 4.45 mi. Parlange-Friscoville Hy., State Rte. 136, S.P. 229-05-05, Pointe Coupee Parish. Bids Apr. 15. CD 4/1.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
May 12 Wisconsin

BIDS ASKED—BUILDINGS

▲ **Mich., Pontiac**—HOSPITAL—B.A. about 5/15—Oakland Hospital, E. A. Tomlinson, pres., 7-226 General Motors Bldg., Detroit, brick, steel, concrete hospital, Woodward and Adams Sts. $3,500,000, Ellerbe & Co., E. 505 First National Bank Bldg., St. Paul, Minn., archts. CD 12/24.

▲ **Mich., Flint**—HOSPITAL—B.A. 5/15—Hurley Hospital, Sixth and Degole Sts., hospital addn., bit. paving, $2,000,000. Fugard, Burt, Wilkinson & Orth, 520 N. Michigan St., Chicago, Ill., archts. CD 12/15/52.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **James I. Barnes Constr. Co.**, 6 Bechtle Ave., Springfield, O., LB **$2,313,900**, general constr.;
Sauer Co. Inc., 1183 Essex Ave., Columbus, O., LB **$435,120**, heating, ventilating, plumbing for women's DORMITORY, COLUMBUS, O. Ohio State University, N. High St., Columbus, O. Bids Mar. 19. CD 3/5.

▲ **McCarthy Constr. Co.**, 4903 Delmar Blvd., St. Louis, Mo. LB, **$3,849,400**, general contract HOSPITAL, EVANSVIELE, IND. St. Mary's Hospital, 173 First Ave., St. Louis, Mo. CD 3/17.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
May 5 Iowa May 8 Kansas
May 21 Arkansas
STREETS AND ROADS
May 5 Iowa May 8 Kansas, Minnesota
May 21 Arkansas

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MISSOURI**—State Hy. Comm., Jefferson City,
Pacific Bridge Co., 333 Kearny St., San Francisco, Calif. CA **$1,447,820**. 4 main span piers and 2 concrete bents, Calloway and Cole Counties; CA **$928,503**, 12 steel plate girder spans, concrete bents, Cole and Calloway Counties.
R. G. Aldridge, 1610 Nebraska St., Kansas City, Kan. CA **$95,756**. one 50 ft., one 79 ft., one 63 ft., continuous I-beam spans, Sta. 1027 plus 85; Phelps Co.; CA **$63,737**, two-75 ft., one 39 ft. continuous I-beam spans Sta. 997 plus 91, Phelps Co.;
Stupp Bros. Bridge & Iron Co., 3860 Weber Rd., St. Louis, Mo. CA **$2,030,085**. 3 steel truss tied arch with anchor spans, Cole and Calloway Counties. Grand total $4,565,901. Bids Apr. 6, awarded Apr. 21. CD 4/10, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Gene Hurley Constr. Co.**, 403 S. Robert St., St. Paul, Minn. CA **$3,500,000**. general contract SHOPPING CENTER, Orme Ave. and S. Robert St., WEST ST. PAUL, MINN. Signal Hills Development **Co., c/o** contractor.

▲ **Priester Constr. Co.**, 1117 Davenport Bank Bldg. Davenport, Ia., CA, Total est. **$6,000,000** footings and foundations Rolling MILL BETTENDORF, IA. Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa. CD 7/17.

▲ **I. E. Millstone Constr. Co.**, 4343 Clayton Ave., St. Louis 10, Mo. CA **$4,367,000**, general contract;
Gartland Plumbing Co., 1021 Big Bend St., St. Louis 17, Mo. CA **$669,786**, plumbing contract;
Sodeman Heat & Power Co., 2306 Delmar Blvd., St. Louis 3, Mo. CA **$748,886**. heating contract for six 11 story buildings, incl. 602 DWELLING UNITS, southeast of Jefferson and Cass Aves. to 21 and Dickson Sts., Sect. 1 of Proj. Mo. 1-5, ST. LOUIS, MO. St. Louis Housing Auth., John J. O'Toole exec. dir., 901 Washington Ave., St. Louis 1, Mo. CD 3/6, under LB.

▲ **Mead & Mount Constr. Co.**, 240 Railway Exchange Bldg., Denver, Colo. CA Est. **$6,000,000**, 19 story, 125x125 ft., steel office and club DENVER, COLO. John D. & Clint W. Murchison, 1201 Main St., Dallas, Tex. Awarded Apr. 6 CD 1/12.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
May 13 California
STREETS AND ROADS
May 13, 14 California

▲† **Oregon**—B.A. 5/19—U. S. Eng., Pittock Block, Portland, powerhouse, Phase 1, substructures for first 14 main units and service station units, complete assembly by, The Dalles Dam, Columbia River, Wasco Co., CIVENG-35-026-53-123. $40,000,000. CD 4/17.

BIDS ASKED—BUILDINGS

▲ **Calif., Milipitas**—ASSEMBLY PLANT, etc.—Bids Asked—Ford Motor Co., 3000 Schaefer Hy., Dearborn, Mich., structural steel erection for assembly plant, office bldg., etc. Total $35,000,000-$50,000,000. Albert Kahn Associated Architects & Engineers, Inc., 345 Center Bldg., Detroit, Mich., engr. CD 2/24.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ † **American Elin Corp.**, 1 Wall St., New York, N. Y., LB, **$1,802,000**, est. $1,900,000, furnishing, installing four 30,000 kva vertical-shaft generatoes for Palisade Power Plant, Palisades Proj., Spec. DC 3904, IDAHO. Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo. Bids Apr. 14. CD 3/5.

▲ † **U. S. Eng.**, City-County Airport, Walla Walla, Wash., rejected bids Feb. 11, grading, draining, paving apron and warm-up pad, Larson Air Force Base, Inv. 53-34, MOSES LAKE, WASH. LB, **$2,471,686**. Will re-advertise. CD 2/17, under LB.

▲ † **A. Teichert & Son, Inc., & Bressi & Bevanda Constructors Inc.**, Box 397, Baldwin Park, Calif., LB **$2,456,386** constr. Rio Hondo Channel from Santa Ana Freeway to Southern Pacific R. R. bridge, River mile 4.19 to River mile 1.53, South Gate, Los Angeles Co., ENG-04-353-53-36, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Apr. 15. CD 3/23.

▲ **P. & J. Artukovich, Inc.**, 13305 S. San Pedro St., Los Angeles, Calif., CA, **$3,238,245**, water pipe line between Southern Ave. and Victoria St. for Middle-Feeder of Colorado River Distribution System (steel pipe), South Gate, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern California, 306 West 3 St., Los Angeles, Calif. Bids Apr. 9, awarded Apr. 14. CD 4/15, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Centex Constr. Co. & Murchison Bros.**, 302 Land Title Bldg., San Diego, Calif., CA, **$7,602,486** construct, manage and finance 16 duplex units and 77 multiple family Military HOUSING Project No. 47, SAN DIEGO, CALIF. Eleventh Naval District, Public Wks. Bldg., San Diego, Calif. Bids Apr. 14. CD 4/20, under LB.

CANADA

BIDS ASKED—BUILDINGS

▲ **Ont., Toronto**—GARAGE, etc.—B.A. 5/20—Canadian National Rys., K. Huffman, ch. engr., Union Station, 6 story, 300x310 ft., concrete, steel brick garage, communications and office bldg., Front and Simcoe Sts. $3,500,000. G. F. Drummond, 355 McGill St., Montreal, Que., archt. CD 2/17.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Ernest Cote**, 148 Lafayette St., Quebec City, Que., CA, **$2,000,000**, 5 story, 50x165 ft., 3 story, 66x125 ft. concrete, steel, brick, stone SEMINARY addn., ST. GEORGES DE BEAUCE, QUE. Seminary of St. Georges, St. Georges de Beauce, Que. CD 2/13.

ALASKA

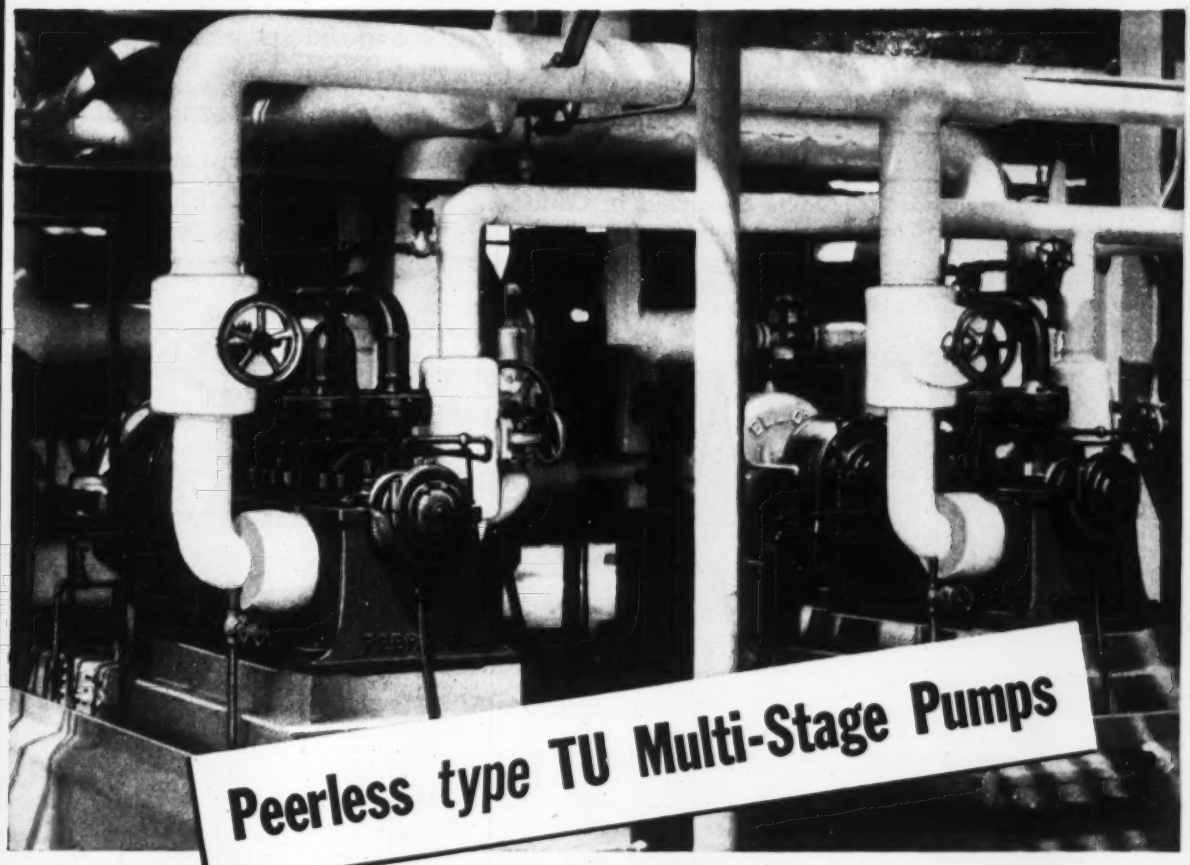
HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Patti MacDonald Constr. Co., Wyatt and Kipper Engineers**, Inc. and Thoraugard Plumbing & Heating, 1310 S. Grand St., St. Louis, Mo., CA. $11,514,007, power house constr. Inv. 53-81, Elmendorf Air Force Base, ALASKA. U. S. Eng., Evergreen Hall, 3013 Arcade Bldg., Seattle 1, Wash. Bids Mar. 31. CD 4/9, under LB.

▲† **Manson-Osberg Co.**, 1132 N. 128 St., Seattle, Wash., LB. **$2,629,360**, 2 tunnels, 4,500 ft. long, rockfill concrete-lined dam, 30x77 ft., powerhouse addn., etc. at Beaver Falls, KETCHIKAN, ALASKA. City, City Hall, Ketchikan, Alaska. Bids Apr. 24. CD 3/11.

(Proposal Advertisements see p. 86 to 88)



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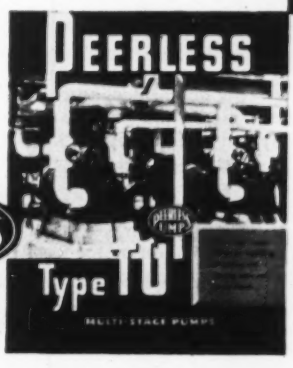

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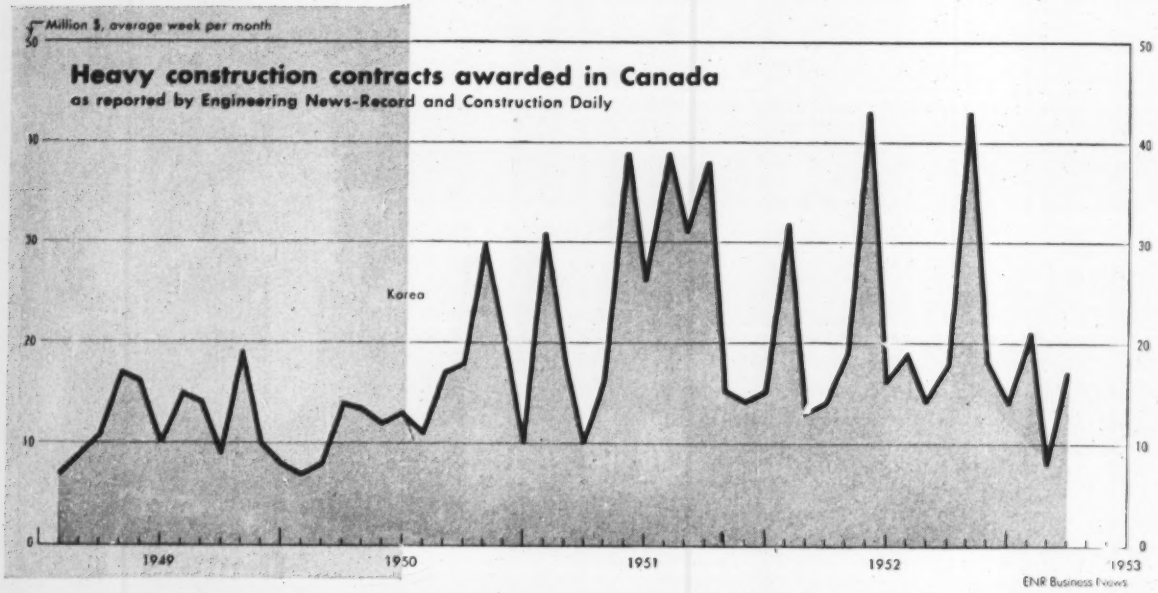

Industrial boom in Canada tapers off; commercial and housing awards climb

Canada's industrial boom is tapering off. That's the picture you get from contract awards as reported to ENGINEERING NEWS-RECORD and the Construction Daily (chart, above). But there's plenty of future work in Canada for construction men.

The chart shows you how contract awards have been slowing down this year. It's plotted on the basis of the average weekly awards in each month, and goes through the first three months only. For April, average weekly awards will show a rise, but that increase will not change the long-term trend.

Latest figures available are for the first 17 weeks of this year. Though total Canadian contract awards are down only 2% from the similar 1952 period, the picture is altered by big gains in commercial building and mass housing. Industrial building—which many business observers consider to be the best tipoff to long-range trends in private construction—is continuing to slow up.

• **Soft spot**—Canadian industrial awards hit their peak back in 1951, and have been falling ever since. In the first 17 weeks, industrial awards were off 38%. Total U. S. industrial awards were up 23%.

As a whole, however, private construction is running ahead of the corresponding period of last year. This is because of big boosts in awards for commercial building (up 460%), and mass housing (up 57%). Private unclassified projects—mainly pipelines—show a 5% gain so far this year because of a $76-million contract for Interprovincial Pipeline Co.'s oil line which extends from Sarnia, Ont., to Superior, Wis.

Public works contract awards for the first 17 weeks total $85.7 million, down 32%. There are big gains in some types of public construction, and big drops in others.

There's a 12% drop, for instance, in the largest category: public buildings (non-housing). There's a 48% decline in unclassified public works. These drops are partly offset by boosts in the classifications of highway awards (up 246%), bridges (up 36%), and sewerage (up 26%).

• **Backlog**—Any actual decline in total work put in place, however, may be a long way off. For Canada's backlog of heavy construction is still growing. It totals $11.8 billion, up $1.1 billion in the year ended March 31 (15% more than in the previous year). This backlog represents total estimated cost of all projects reported as proposed, minus those jobs which have either moved into the bid stage or which have been abandoned.

Private projects have accounted for most of the growth ($0.9 billion), largely because of the rush of commercial building and mass housing proposed in this period. The combined backlog for these types is now $1.5 billion, up nearly $0.7 billion from March, 1952. That's 20 times the increase for the preceding year. It indicates that many commercial and mass-housing jobs may come out of the backlog soon.

• **Expansion slows**—However, it is significant that backlogs of industrial building and private unclassified work, which are the largest in dollar volume, have gained only slightly since March, 1952. This indicates Canadian industry has now pretty well carried out its current expansion plans.

The private unclassified category has the largest backlog ($2.5 billion), much of it proposed pipeline construction. About $1.1 billion of this unclassified work was proposed in the nine months after Korea. Again, most of the work proposed in that period was for the building of new oil and gas pipelines.

The backlog of public works is growing much more slowly than the private backlog—indicating that economy has taken hold in Canada. In the 12 months ended in March, the public-works backlog grew only about half as fast as in the preceding year. Backlogs of some types are actually lower than a year ago. Among these are: earthworks and waterways, highways, and waterworks.

Fannie Mae goes on

Agency survives House move to end its operation

An Appropriations Committee move designed to put Federal National Mortgage Assn. out of business ran into such opposition among House members that it was deleted from the first 1954 Appropriations Bill—for Independent Offices—which cleared the House this week.

The committee bill called for ending all Fannie Mae mortgage purchases after June 30 and at same time directed the Administrator to sell $1 billion worth of the $2.5 billion of mortgages in its portfolio this year, even if it meant dumping them on the market at a discount (ENR Apr. 23, 1953, p. 22).

This was too strong even for conservative Rep. Jesse Wolcott, chairman of the House Banking Committee. Wolcott charged the committee bill would threaten housing construction if Fannie Mae were removed as a secondary mortgage market.

Between the time the committee bill came out and its reaching the House floor Wolcott went into action and conferred with Housing and Home Finance Administrator Albert Cole. They came up with a new policy designed to head off the committee proposal.

This new policy would call for Fannie Mae selling as many mortgages as the market can safely absorb and at the same time continuing to buy new mortgages. The administrator would retain discretion to sell mortgages at a discount, after conferring with the Treasury.

Rep. John Phillips, chairman of the Independent Offices Appropriations Subcommittee, offered an amendment, killing the Fannie Mae proposal. It was adopted by a voice vote.

Wolcott said he believed that the top amount of mortgages that the market could absorb in a year would be $250 million. He said that by other actions, such as amortization payments, canceling of unused authority for non-defense activitities, and others, Fannie Mae might be able to return to Treasury close to the $1-billion goal of the committee.

Wolcott said that while the Administrator would have some flexibility in disposing of the mortgages, he would confer with the Treasury to determine the amount of discount dictated by market conditions on the day of sale.

In opposing the move to take Fannie Mae out of the secondary mortgage market, Wolcott said that it was more important to encourage private housing construction, even at the risk of a federal deficit.

Title I racketeers bother Californians

A new breed of sales racketeers has moved into California. Their speciality: home repairs by FHA loans.

The situation has annoyed the San Francisco Better Business Bureau so much that it just took the unusual step of convening for a mass press conference the prosecuting authorities, better business bureaus, and trade association spokesmen from three counties.

Key to the dodge is the FHA-insured loan for home repairs and modernization, the so-called Title I loan. Under Title I you can borrow up to $2,500 for repairs or additions.

The racket boys have turned the legitimate Title I loan to their own purposes. Their dodge has several variations. Here is a simple one. An itinerant house-to-house salesman, working out of his suitcase, talks a householder into a contract for an exterior paint job. He includes enough in the price for a fat commission for himself, then peddles the paper to a painting contractor and steps out of the picture. With the contractor's help, the home owner borrows the money at the bank under Title I and the work is done.

At the very minimum the owner has been bilked for the amount of the commission. In the nature of things he has been bilked for plenty more. The kind of contractor who will buy a shady contract won't hesitate to use shoddy materials and shortcuts.

CONSTRUCTION TRENDS

You may be surprised by some figures, on buyers' initial equity in new houses bought during 1949-1951, compiled by the Bureau of Labor Statistics. It shows that in many cases the word buyer should have been put in quotes.

Take Los Angeles, for example, where a full-scale building boom has been going on since World War II. You'll find that in the second half of 1949, 38% of the owners of new mortgaged one-family houses had exactly zero initial equity.

BLS also studied new mortgages in the last quarter of 1950, and in the first quarter of 1951. In those periods, the ratio of new owners without any initial equity was also high. In Los Angeles, for instance, it was 51%, the highest for any of the 10 metropolitan areas for which BLS compiled figures.

BLS didn't carry its figures beyond the first quarter of 1951. If it had, you would have seen quite a sharp drop in the number of people buying houses with little or no equity. The down payment provisions of Regulation X took hold as 1951 went on. And lenders became a lot less eager to make mortgage loans.

The situation on down payments hasn't gotten any better since the Federal Reserve Board dropped Regulation X last fall. Last week, for instance, the National Association of Home Builders published a survey of its members which indicated that 60% of all non-veterans who try to finance homes with FHA mortgages can't make the required down payment.

You can find confirmation of this in the BLS study. In 1949, the median income of buyers of new one-family houses was $4,000. By the first quarter of 1951, it was only $4,600. When a prospective buyer's income is at that level, he usually won't be able to save much to put into a home, even though he may have no difficulty with monthly carrying charges.

The figures suggest that the present high level of housing starts can't continue much longer unless low-income families can buy houses. That's why NAHB would like FHA to ease up on its down payment requirements.

But even if FHA goes along, there are going to be quite a few lenders who will insist on being conservative.

So you cannot count on mortgage money being easy to find for some time to come.

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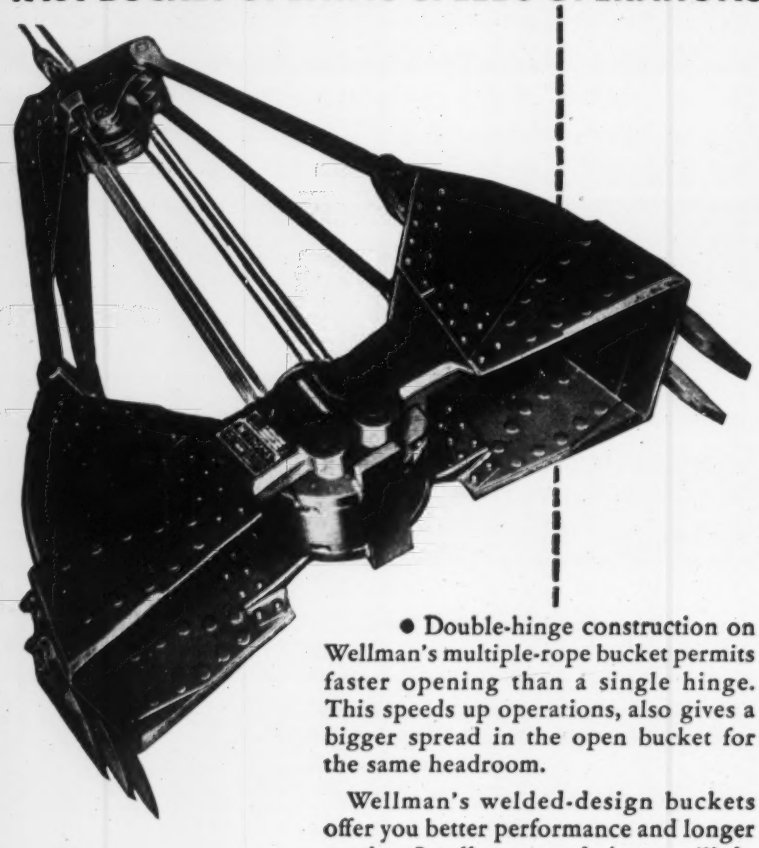

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BLACK GOLD—Some city-owned wells, developed and operated by Richfield Oil Corp. Richfield gives city 60.1% of revenue until it gets back drill costs, then pays city 94.1% less cost of production. Long Beach is now getting $625,000 monthly from the wells in this picture.

Happy Long Beach

It has $120-million from saved-up oil revenues

When voters in most municipalities ballot on large sums for civic improvements, they're passing on bond issues or otherwise deciding whether to obligate themselves financially.

Not the citizens of Long Beach, Calif. (pop 254,800). They went to the polls early this month and cast their votes on $60,187,000 of public projects in the happy knowledge that the money is already in the bank.

It comes from a $120-million-plus nest egg that has been accumulating in oil revenues since 1947, when the city decided it would be good sense to set aside revenues from city-owned wells in "tidelands" areas until the question of federal-state ownership was finally settled.

• **Bonanza**—Long Beach's oil bonanza got under way in 1937, when the first well within the city limits was drilled. Exploitation of reserves under the adjacent marginal seas began in 1938. The city had acquired a 13,027-acre area off its original shoreline (to the 3-mi limit) by a state grant made in 1911 and amended in 1924 and 1935. But legal technicalities prevented drilling in the area until 1938.

Since then Long Beach oil income has grown by leaps and bounds. From the marginal sea area, the city is now getting royalties of $2,525,000 a month. (Gross royalties on individual wells run as high as 94.1%, less cost of production.) Total receipts to date are upwards of $170 million. From the

"uplands" area—within Long Beach's original land boundaries—the city is getting $107,000 a month from wells in which it has a part interest.

Of this impressive total the city has spent about $46 million on harbor improvements, including some 1,000 acres of filled land. In 1947, after the U. S. Supreme Court decision that the federal government had "paramount rights" over the marginal seas, Long Beach stopped spending revenue from the grant area. (It continued to spend as needed from "upland" royalties.)

Now, however, certain that the tidelands question is about to be settled in the states' favor, Long Beach has lifted its self-imposed restriction. Hence the vote.

• **Too much**—The original state grant stipulated that all revenues from the grant were to be used for harbor improvements. When it became apparent revenues were to be so huge they couldn't reasonably be all used on the harbor, the city began negotiating for a change freeing part of the funds for general civic improvements. By an agreement Feb. 15 of this year, the city was permitted to divide the revenue 50-50—half for the harbor department, half for general fund.

The vote this month was not binding on the city council, but was intended for its guidance. Even though the voters didn't have the usual pocketbook interest, they exercised their prerogatives by disapproving a $10-million project for a civic center. But they okayed $50,187,000 worth of projects—including $16,382,000 for a hospital program, $10 million for a small boat harbor, $6,750,000 for acquisition and improvement of parks, $3.5 million for airport improvements, $3 million for storm drains.

Some of these projects have been on tap for some time, and tentative plans exist for them already. Designs for others will have to start from scratch. It probably will be at least a year before there's any contract letting.

A question of cement

Claude K. Boettcher, Denver financier and board chairman of Ideal Cement Co., has parted company with William Zeckendorf, colorful New York real estate man, over a question of cement.

Boettcher had been associated with Zeckendorf's firm, Webb & Knapp, Inc., in building a $15-million office and shopping center in Denver. Boettcher wanted to build a 23-story skyscraper that was part of the project

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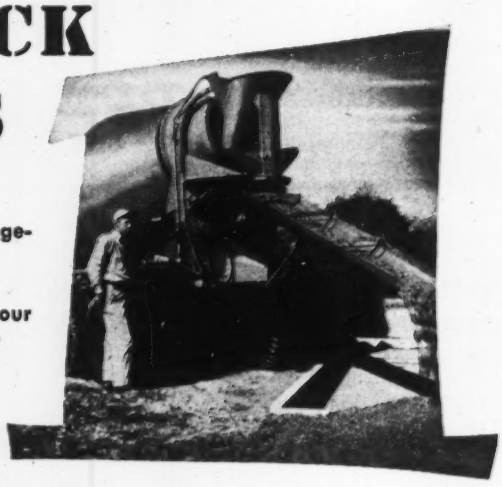

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out of reinforced concrete. Webb & Knapp insisted on steel.

Boettcher explained that "a steel building, when properly fireproofed, uses almost as much cement as a reinforced concrete building, so that from the standpoint of sale of cement the difference between the two types is negligible."

"As a matter of principle, however, with my extensive interests in the cement industry and my own belief in the superiority of this type of construction . . . I believed that, to be consistent, I should be adamant on this point."

Boettcher's interest in the Denver project has been taken over by George A. Fuller Co., of New York, which will also act as contractor.

Business briefs . . .

• **Housing starts** in March were 97,000, according to the Bureau of Labor Statistics. That's 7% below March of last year, and a smaller rise than usual. (26% above the figure for February.)

• **Southern California Edison Co.** has decided to postpone construction on account of "the changing business outlook." The company had planned to raise $40 million for construction this spring, now plans to raise $30 million later this year and defer some maintenance and new construction to later years.

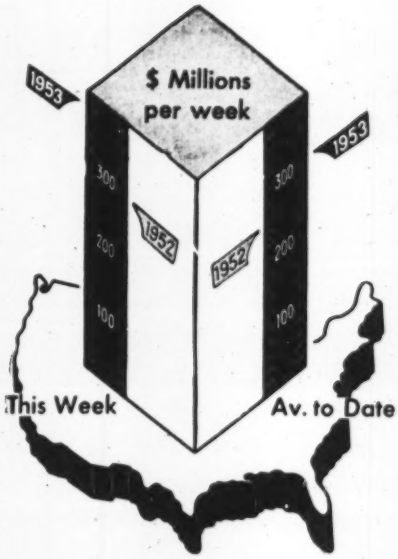
• **Liquid savings** of individuals, some of which goes to finance construction, rose to $14.6 billion in 1952, according to the Securities and Exchange Commission. That's the highest volume these savings have reached since World War 2.

• **Volume of certificates of necessity** for fast-tax-write-offs of defense plant construction is still holding steady, according to figures of the Office of Defense Mobilization.

• **Non-farm mortgages** of $20,000 or less totaled $2.8 billion during January and February, says the Home Loan Bank Board. That's 9% more than the same 1952 period.

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

	This Week	Cumulative 18 wks 1953	1952	% chge
Federal	$25.6	$544.3	$687.7	−21
State and Municipal	172.4	1,761.4	1,383.8	+27
Total pub.	198.0	2,305.7	2,071.5	+11
Total priv.	185.1	3,287.1	2,425.1	+36
U. S. Total	**$383.1**	**$5,592.8**	**$4,496.6**	**+24**

Contracts by type of work

Waterworks	$4.2	$88.5	$83.4	+6
Sewerage	12.6	125.2	75.6	+66
Bridges	30.2	295.7*	124.0	+138
Highways	87.3	534.7	446.9	+20
Earthwork, Waterways	10.3	128.6	219.4	−41
Buildings: Public, excl. hsg.	23.5	578.4	562.6	+3
Housg., pub.	10.7	239.3	338.0	−29
Housg., priv.	64.9	1,424.2	1,002.5	+42
Commercial	25.0	344.6	189.1	+82
Industrial	40.8	1,227.2	1,008.2	+22
Unclassified	72.6	606.4	446.9	+36
Total	**$383.1**	**$5,592.8**	**$4,496.6**	**+24**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,00; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

* $66.-million contract for Mac'kinac Bridge Auth. included, pending final action of Michigan legislature.

ENR indexes		Base Year = 100 — 1913	1926	1949
Constr. cost.	Apr.	589.53	283.39	123.59
	Mar.	587.44	282.38	123.15
Bldg. cost	Apr.	426.45	230.53	121.22
	Mar.	424.89	229.68	120.78
Volume	Mar.	547	222	158

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OFFICIAL PROPOSALS

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New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 7th day of May 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1				
		G. L. NICKERSON, District Engineer, 353 Broadway, Albany, New York				
Wash. & Saratoga	R.C. 53-35	Northumberland Bridge	0.10	Repairs and Painting Exist. 530' Truss Bridge	$6,000 Plans $10	$103,000
		DISTRICT No. 2				
		L. KETCHUM, District Engineer, 109 No. Genesee St., Utica, New York				
Fulton	F.A.C. 53-10 F.A.R.C. 53-30	City of Johnstown Route 148 By-Pass (Chestnut St. to East Main St. and Briggs St. to E. City Line); Fonda-Johnstown, S. H. 5096 Project U-419(5)	2.87	Asphalt Conc. Ty. 1A, Opt.	45,000 Plans $15	790,000
Oneida	M.T. 53-7 S.T. 53-19	New York State Thruway, Mohawk Section Sub. 8 (Whitesboro-Utica West City Line); Woods Rd.; Mohawk St. C. R. 107 & Special Drive	4.03 Thy. 1.11 Acc.	9" Cem. Conc. Pavt. 2 @ 25' Wide = 4.23 Mi. Asp. Conc. Ty. 1A, Opt. = 0.40 Mi. Found. Crse. Grav. = 0.70 Mi. Misc. Work = 0.01 Mi. 2 Hy. Seps. Comp. I-Beams 148.8' and 110' 1 RR Sep. Plate Girder 228.9' 1 RR Sep. Comp. I-Beam 572' 2 Brs. Plate Girders 380' and 346' 1 Br. Closed Box 32.8'	400,000 Plans $100	7,412,000
		DISTRICT No. 3				
		WILLIAM ROBINSON, District Engineer, Weigh Lock Bldg., Syracuse, New York				
Onondaga	M.T. 53-8 O.T. 53-8 S.T. 53-36 R.C. 53-36	New York State Thruway, Mohawk Section, Sub. 8B and Ontario Section Sub. 8A (Electronic Pkwy. & Thompson Rd.); 2 Interchanges; 4 Access Roads; Syracuse-Bridgeport Pt. 1, S. H. 672	1.57 Thy. 5.01 Acc.	9" Cem. Conc. Pavt. 24' Var. Wide = 4.16 Mi. Asp. Conc. Ty. 1A, Opt. = 0.37 Mi. Found. Crse. Grav. = 0.20 Mi. Misc. Work = 1.85 Mi. 4 Hy. Seps. comp. I-Beams 198', 205', 196.7' & 220.5'	$100,000 Plans $50	1,768,000
Wayne	R.C. 53-32	Various Highways in Wayne County	...	Tree Removal of 143 Trees and Pruning of 300 Trees	$8.00 No Plans Prop. $2	14,000
		DISTRICT No. 4				
		E. G. H. YOUNGMANS, Barge Canal Terminal, Rochester, New York				
Monroe	F.A.C.G. 53-11	Rochester City: Inner Loop (Genesee River) Bridge and Approaches Project U-UG-231(3)	0.36	Asp. Conc. Type 2A R. R. & River Viaduct 1187'	$170,000 Plans $25	2,976,000
Ontario	O.T. 53-7 S.T. 53-18 R.C. 53-34	New York State Thruway, Ontario Section Sub. 12 Rochester East-Rte. N. Y. 96 Interchange; Willow Rd.; Pittsford-Victor Pt. 2 S. H. 8223	1.10 Thy. 4.26 Acc.	9" Cem. Conc. Pavt. 12'-44' Var Wide = 2.80 Mi. Found. Crse. Grav. = 0.03 Mi. Asp. Conc. Ty. 1A, Opt. = 0.15 Mi. Misc. Work = 2.38 Mi. Hy. Sep. Comp. I-Beam 217' Hy. Sep. Closed Box 24.2' Hy. Sep. Extend. Exist. 18.3' Closed Box	$52,000 Plans $25	945,000
		DISTRICT No. 5				
		C. R. WATERS, District Engineer, State Office Bldg., Buffalo, New York				
Erie	G.I.S.P. 53-1	Grand Island State Parkway; South Parkway Extension (Beaver Island State Park)	2.80	Asp. Conc. Type 1A, Opt. Including Toll Houses Parking Areas, Electrical & Misc. Work	$25,000 Plans $15	452,000
		DISTRICT No. 6				
		JAMES H. THOMAS, District Engineer, State Office Bldg., Hornell, New York				
Steuben	F.A.S.S. 53-4	Coopers Plains-Monterey C. R. 26 Project S-738(2)	0.25	Asp. Conc. Ty. 1A, Opt. = 0.22 Mi. Misc. Work = 0.03 Mi. Re-Erect 155' Sp. Thru Truss	$9,500 Plans $10	172,000
		DISTRICT No. 8				
		J. S. BIXBY, District Engineer Pleasant Valley Road, Poughkeepsie New York				
Columbia	R.C. 53-31	Various Highway in Columbia County	...	Tree Removal of 173 Trees	$800 Plans $10	14,000
Orange & Ulster	C.T. 53-9 S.T. 53-21 RC. 53-37	New York State Thruway, Catskill Section-Sub. 5 (Newburgh-New Paltz Pts. 1 & 2); 1 Interchange 10 Access Rds.; Coeheeton Turnpike Pt. 1 S.H. 113; Newburg-Shawangunk S. H. 161; Plattekille-Modena S. H. 307	16.52 Thy. 7.88 Acc.	9" Cem. Conc. 2 @ 25' Wide = 19.37 Mi. Asph. Conc. Ty. 1A, Opt. = 3.51 Mi. Found. Crse. Gravel = 0.88 Mi. Misc. Work = 0.64 Mi. 1 Hy. Sep. Conc. Rigid Frame 31' 1 Br. Closed Conc. Box 30' 1 RR Sep. Comp. I-Beam 199.5' 11 Hy. Seps. Comp. I-Beams 212.3', 133', 202.8', 212.8', 219.9', 288.5', 205.9', 231.9', 45', 166.3', and 207.7'	$690,000 Plans $100	12,504,000
Rockland	Pip 53-1 RC. 53-29	Palliades Interstate Parkway, Sect. 2 & Pt. 1 Coyles Corners-Short Cove, S. H. 9005 Valley Spring-Mount Ivy, S. H. 1019	5.05 Pkwy. 4.18 Acc.	Grading = 5.45 Mi. 8" & 9" Cem. Conc. Pavt. 24' Var. Wide = 0.78 Mi. Asp. Conc. Ty. 1A, Opt. = 1.89 Mi. Bit. D. S. T. Graded Gravel = 1.11 Mi. 6 Hy. Seps. Rigid Frame Arches 135.7', 119.3', 122.7', 107', 48.4' and 115.9'	$200,000 Plans $100	3,497,000
		DISTRICT No. 10				
		M. GOUL, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, Long Island, N. Y.				
Queens	FAVWE 53-1 FAGCP 53-1	Grand Central Parkway; Van Wyck Expressway Connection; Van Wyck Expressway (Cont. 17) Project U-741(21); U-658(20); U-1085(15)	4.31	Directional Signs and Misc. Work	$6,000 Plans $10	106,000
Bronx	FAMDE 53-3	Major Deegan Expressway Contract 7A Project U-UI-1082(14)	0.47	Grading, Drainage Walls & Misc. Work 2 Hy. Seps. Comp. I-Beams 100.2' & 97' I-Beam Viaduct 656'	$173,000 Plans $100	3,150,000
Suffolk	B.P. 53-40 and 41	Fireplace and Crabmeadow Beaches	...	Beach Protection 4 Conc. Block Groins	5% of Bid Plans $10	63,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Bids: May 12, 1953

WEST VIRGINIA TURNPIKE COMMISSION
ADVERTISEMENT FOR PROPOSALS

Sealed proposals will be received by the West Virginia Turnpike Commission for:

Contract No. 21

The work to be done under this contract consists in performing the required grading and drainage for approximately 6.32 miles of the West Virginia Turnpike including the relocation of approximately 3.83 miles of U. S. Route 19-21 and approximately 1.75 miles of other side roads including the temporary relocation of sections of existing U. S. Route 19-21 plus the construction of the substructures for bridges known as structures 10 and 12. This work is located between a point 3 miles north of Camp Creek about mile 13.7 and the village of Ghent mile 20, Mercer and Raleigh Counties, West Virginia, and is in connection with the construction of the West Virginia Turnpike in the State of West Virginia.

The principal items of work include:

	Approximate Quantity
Clearing and Grubbing	65 acres
Excavation (all types) Including Borrow	2,775,000 c. y.
Concrete	1,800 c. y.
Reinforcing Steel	108,000 lbs.
Culvert Pipes and Underdrains	81,400 lin. ft.
Relocation of U. S. Route 19-21	
Hot-Laid Asphaltic Concrete Surface Course	5,400 tons
Penetration Macadam Aggregate	15,300 tons
Base Course Material	14,700 c. y.
Guard Rail	14,300 lin. ft.

Proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia until 9:00 A.M. Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia until 10:00 A.M. Eastern Standard Time, on May 12, 1953, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA TURNPIKE COMMISSION
D. H. Morton
Chairman

OFFICIAL PROPOSALS

Bids: May 19, 1953

New Jersey Turnpike Authority

NEW BRUNSWICK, N. J.

Sealed proposals will be received by the New Jersey Turnpike Authority for:

CONTRACT NO. 302

The work to be performed consists generally of the following:

The furnishing and installation of two structural steel sign bridges, additional guard rail and the structural steel supports for a wood sign (furnished by the Authority) together with the erection of the wood sign, all at or adjacent to the Elizabeth Interchange;

The furnishing and installation of a structural steel support for two signs and additional guard rail, adjacent to the Lincoln Tunnel Interchange.

Proposals will be received at the office of the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey until 11:00 A.M. Eastern Daylight Saving Time on May 19, 1953, at which time and place said proposals will be publicly opened and read.

The receipt and opening of proposals is subject to proper prequalification of the bidder in accordance with the regulations adopted by the New Jersey Turnpike Authority. Bidders must also submit with their proposal a revised financial statement of plant and equipment.

Contract documents may be seen and may be inspected by prospective bidders during office hours after April 30, 1953, at the office of the New Jersey Turnpike Authority, Administration Building, New Brunswick, New Jersey, and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York, New York.

Contract documents will be furnished for $5.00 for each set, upon application to the Authority. The payment will not be refunded and contract documents are not required to be returned.

Proposals must be made upon the standard proposal forms in the manner designated in the Standard Specifications for Construction of the New Jersey Turnpike, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and the number of the contract on the outside, and must be accompanied by a certified check drawn to the order of the New Jersey Turnpike Authority and a proposal bond, each for not less than five (5) percent of the amount of the proposal, but not less than $500.00 nor more than $200,000.00 and must be delivered at the place designated above on or before the hour named. Copies of the proposal form to be used for submitting proposals, of the form for the proposal bond, of the form to be used for the financial statment and for the plan and equipment statement to be submitted with the proposal and of the special addressed envelope are furnished in detached form with the contract documents.

The Contract will be awarded or the proposals rejected within thirty (30) days from the date of opening proposals. The Authority reserves the right to accept that proposal which in its sole judgment will be in its best interests.

THE NEW JERSEY TURNPIKE AUTHORITY
April 30, 1953 Paul L. Troast, Chairman

Bids: May 19, 1953

Contract No. 28C

Sealed proposals will be received by the West Virginia Turnpike Commission for:

The work to be done under this Contract consists in performing the required grading and drainage for approximately 0.6 miles of the West Virginia Turnpike including construction of approximately 0.4 miles of ramps for the Charleston Interchange and substructures for Bridges Nos. 90 and 91. This work is located between Station 2494, mile 87.4, and Station 2528, mile 88.6, Kanawha County, West Virginia, and is in connection with the construction of the West Virginia Turnpike in the State of West Virginia.

The principal items of work include:

U. S. Government

	Approximate Quantity
Clearing and Grubbing	30 Acres
Excavation (all types)	624,000 Cu. Yds.
Concrete	1,320 Cu. Yds.
Reinforcing Steel	80,200 Pounds
Steel Piles (Furnish)	484,500 Pounds
Steel Piles (Driven)	9,100 Lin. Ft.
Culvert Pipes and Underdrain	1,800 Lin. Ft.
Concrete Cribbing	3,500 Cu. Ft.

Proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia until 9:00 A.M. Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia until 10:00 A.M. Eastern Standard Time, on May 19, 1953, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA TURNPIKE COMMISSION
April 21, 1953 D. H. Morton, Chairman

Bids: May 11, 1953

Grading For New Coach Yard Tracks

Grading for new coach yard tracks at Plainfield, N. J. and grading for temporary main line railroad tracks at Dunellen, N. J., under the Dunellen-Plainfield Grade Crossing Elimination, Order of the Public Utility Commission, State of New Jersey.

Sealed proposals will be received by The Central Railroad Company of New Jersey, at the office of the Chief Engineer of the Railroad, located at the Jersey City Terminal, Room No. 44, Foot of Johnston Avenue, Jersey City, New Jersey, until 1:00 P.M. Daylight Saving Time, Monday, May 11, 1953, and then publicly opened and read, for grading consisting of borrowed fill 18,000 cubic yard for new coach yard tracks at Plainfield, N. J., and grading consisting of common excavation of 20,000 cubic yards for roadbed for temporary main line railroad tracks, excavated material to be placed and compacted where required for the same roadbed, Dunellen to Middlesex, N. J.

Proposal forms, drawings, specifications, bond and insurance requirements may be obtained at the office of the Chief Engineer of The Central Railroad Company of New Jersey, at the above address on or after April 27, 1953.

This work will be awarded as a general contract and the successful bidder will be required to perform with his own organization not less than 80% of the total value of the contract, except for materials or items of work which require specialized knowledge, craftsmanship or equipment not ordinarily available in the contractor's organization.

S. L. Mapes, Chief Engineer,
The Central Railroad Company of New Jersey,
Jersey City Terminal, Jersey City 2, N. J.
April 16, 1953.

Bids: November 2, 1953

Iraq Government—Development Board
Dokan Scheme
Dam & Ancillary Works

1. Tenders are invited by the Development Board of the Government of Iraq for the construction of a dam and ancillary works at Dokan on the Lesser Zab River.
2. The Contract Documents and Instructions as to tendering may be inspected on and after the Second day of May 1953 at any of the following places namely:—
   (a) The Offices of the Development Board, Baghdad.
   (b) The Iraqi Embassy, Washington, D. C., U. S. A.
   (c) The Royal Iraqi Legation, Paris.
   (d) The Royal Iraqi Legation, Brussels.
   (e) The Royal Iraqi Legation, Rome.
   (f) The Offices of Messrs: Binnie, Deacon & Gourley, Artillery House Artillery Row, London S.W.1., England.
3. Firms desiring to tender may obtain copies of the Contract Documents between the Second day of May 1953 and the First day of October 1953 (both days inclusive) from either the Development Board in Baghdad, or Messrs: Binnie, Deacon & Gourley in London upon payment of Twenty Iraqi Dinars. One Iraqi Dinar is equivalent to one Pound Sterling.

OFFICIAL PROPOSALS

4. Tenders must be accompanied by a deposit of I.D.50,000 (Fifty thousand Iraqi Dinars or the equivalent in Pounds Sterling), such deposit to be paid in cash to the Secretary General of the Board in Baghdad or to his order by cheques drawn on an approved Bank in Baghdad. Full detailed conditions as to this deposit may be ascertained from the "Instructions to Persons Tendering" attached to the Contract Documents.
5. Tenders must be submitted to the Development Board, Baghdad, and will be received up to noon on the Second day of November 1953.
6. Particular attention is drawn to Article 21 of the Instructions to Persons Tendering, namely, that tenders will only be accepted from firms of Contractors who have previously executed works of a similar nature and magnitude.

Secretary General,
Development Board.

Bids: May 12, 1953.

Construction of Two-Lane Vehicular Tunnel

WEST VIRGINIA TURNPIKE COMMISSION

ADVERTISEMENT FOR PROPOSALS

Sealed Proposals will be received by the West Virginia Turnpike Commission for:

CONTRACT NO. 17

The work to be done under this Contract consists of furnishing all labor and material required for the electrical installation for a two-lane vehicular tunnel, approximately one-half mile long, two ventilation buildings, a service building and areas adjacent to the buildings, which are to be constructed under other contracts in connection with the construction of the West Virginia Turnpike in the State of West Virginia.

The southerly tunnel portal, the southerly ventilation building and the service building are located in the vicinity of Four Mile Fork about one-half mile west of the town of Standard and the northerly tunnel portal and the northerly ventilation building are located at approximately Mile 68.3 in the vicinity of Giles Creek about one and one-half miles east of the town of Fairfield in Kanawha County, West Virginia.

Proposals will be received at the office of the West Virginia Turnpike Commission, 1340 Wilson Street, Charleston 5, West Virginia until 9:00 A. M. Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia until 10:00 A. M. Eastern Standard Time, on May 12, 1953, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA TURNPIKE COMMISSION
D. H. Morton, Chairman
April 10, 1953

U. S. Government

DEPARTMENT OF THE INTERIOR. Bureau of Reclamation. Sealed bids (Invitation No. DS-3941) will be received at Denver, Colorado until May 14, 1953, for furnishing four vertical traveling water screens for Delano-Earlimart Irrigation District, Central Valley Project, California. Delivery is desired within 240 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

FRED G. AANDAHL, Assistant Secretary
for Water and Power Development
Department of the Interior

(More official proposals on page 88)

OFFICIAL PROPOSAL

RATE: The rate for Official Proposal Advertising is $1.50 per line (or fraction) per insertion.

COPY RECEIVED: up to Friday for issue out following Thursday subject to space open for last minute ads.

SEND COPY: to Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

OFFICIAL PROPOSALS

Bids: May 8, 1953

NOTICE TO BIDDERS

Contract M-1
Contract M-2
Contract M-3
Contract M-1&2
Contract M-1&3
Contract M-2&3
Contract M-1, 2&3

Sealed proposals will be received by the Ohio Turnpike Commission for the sale to the Ohio Turnpike Commission of fabricated structural steel and other appurtenant steel items in accordance with each of the contracts enumerated above.

The performance required under Contract M-1 consists of the sale, including delivery, of fabricated structural steel and other appurtenant steel items for eight twin and six single bridge structures of from one to five spans each, in Construction Sections 2 and 3 in Design Section D-1 of Ohio Turnpike Project No. 1 in Mahoning County, Ohio. Railings, steel piles and scuppers are not included in the items to be furnished.

Approximate quantities of the items in Contract M-1 are as follows:

Fabricated Structural Steel . . 4,922,000 lbs.
Structural Expansion and/or Contraction Joints . . . . . 296,400 lbs.

The performance required under Contract M-2 consists of the sale, including delivery, of fabricated structural steel and other appurtenant steel items for twelve twin and ten single bridge structures of from one to six spans each, in Design Section D-2 of Ohio Turnpike Project No. 1 in Mahoning and Trumbull Counties, Ohio. Railings, steel piles and scuppers are not included in the items to be furnished.

Approximate quantities of the items in Contract M-2 are as follows:

Fabricated Structural Steel . . 8,043,000 lbs.
Structural Expansion and/or Contraction Joints . . . . . 255,000 lbs.

The performance required under Contract M-3 consists of the sale, including delivery, of fabricated structural steel and other appurtenant steel items for nine twin and twelve single bridge structures of from three to five spans each, in Design Section D-3 of Ohio Turnpike Project No. 1 in Trumbull and Portage Counties, Ohio. Railings, steel piles and scuppers are not included in the items to be furnished.

Approximate quantities of the items in Contract M-3 are as follows:

Fabricated Structural Steel . . 4,638,000 lbs.
Structural Expansion and/or Contraction Joints . . . . . 183,300 lbs.

Contracts M-1&2, M-1&3, M-2&3, and M-1, 2&3 are combination contracts. The performance required under each such combination contract is the sale of the fabricated structural steel and other appurtenant steel items, including delivery, above set forth for the above-mentioned individual contracts containing the same numerals as a part of their captions. The steel and incidental performance required under Contract M-1&2 is thus the same as that required under Contract M-1 and Contract M-2, taken together. The performance required under the other combination contracts corresponds in like manner to that required under the individual contracts to which their captions are similarly related.

Copies of the Plans for said Contracts, and of the General Specifications for Ohio Turnpike Project No. 1, a part of which constitute Specifications applicable to these Contracts, are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 361 East Broad Street, Columbus 15, Ohio. These documents may be purchased from said chief engineer for the following sums, per set, which sums are non-returnable:

General Specifications for Ohio Turnpike Project No. 1 . . . . . $ 5.00
Plans, per set, per individual contract 15.00

Forms or copies of all remaining Contract Documents, including Proposals for each of the Contracts set forth above; the Affidavit which must accompany any such Proposal; this Notice to Bidders; the Special Provisions, which specify, among other things, which of the aforesaid General Specifications apply to these Contracts; the Contract to be entered into with the (or each) successful Bidder; and the Contract Bond to be furnished with such Contract will be furnished upon request and without charge to any interested person at the aforesaid chief engineer's office on and after April 24, 1953.

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each Proposal must be accompanied by a certified check, or checks, on a solvent bank, or banks, payable to the order of the Ohio Turnpike Commission, in an amount not less than 5 percent of the amount bid, and, in the case of a multiple bid, of the highest total which can be obtained by adding the contract prices of any group of contracts which could be awarded to the Bidder on the basis thereof. The Commission may at any time cash any such check. Each such check, or the proceeds thereof, will be held by the Commission as a guaranty that, if any Proposal guaranteed thereby is accepted, a Contract will be entered into and the performance of the Proposal secured. Each such check, or the proceeds thereof, will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications; provided that if there be a forfeiture, it shall be of an amount equal to 5% of the total amount bid in the Proposal with respect to which the forfeiture occurs, and any excess thereover will be returned to the Bidder.

All bids must be received at or before 10:00 A.M., Eastern Standard Time, May 8, 1953, in the offices of the Ohio Turnpike Commission, 361 East Broad Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the ballroom of the Seneca Hotel, 361 East Broad Street, Columbus 15, Ohio, where all Proposals will be publicly opened and read.

The award of any of the above-enumerated Contracts, if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for supplying the steel to be purchased, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION
DATED April 21, 1953

Bids: May 18, 1953

Painting a Portion of the Delaware River Bridge—Contract No. 30-E

DELAWARE RIVER PORT AUTHORITY
CAMDEN, NEW JERSEY

Sealed bids will be received for the Painting of grid beams and related steel under Lanes I and s of the present bridge, to be identified as Contract No. 30-E at the office of the Secretary of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 1:30 P. M. Daylight Saving Time, Monday, May 18, 1953 and then and there will be publicly opened and read.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified or cashier's check in the sum of $5,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office either in Philadelphia, Pennsylvania or Camden, New Jersey and the Surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the work to be done.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids; and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
Joseph K. Costello, Secretary

Bids: May 19, 1953

Furnishing and Erecting Traveling Electric Crane

SEALED PROPOSALS WILL BE RECEIVED AT ROOM 313, CITY HALL ANNEX UNTIL 1:30 P. M., EASTERN DAYLIGHT SAVING TIME, FOR DEPARTMENT OF STREETS on Tuesday, May 19, 1953.

Furnishing and Erecting Electric Traveling Crane at the Harrowgate Incinerator Furnishing and Erecting Incinerator and Smoke and Flyash Elimination Equipment at the Harrowgate Incinerator (Proposal and plans for this schedule may be obtained from the Department of Streets, Room 1012, City Hall Annex, upon making a deposit of $10.00 in cash or by check made payable to the City of Philadelphia, which will be refunded upon return of the documents in good condition within 10 days after the contract is awarded)

NOTICE: No bid for this work will be received unless the questionnaire with all questions fully answered is filed with the Street Commissioner, Room 1002, City Hall Annex, at least one (1) week previous to the date of opening bids. Proposals may be obtained at Room 1012, City Hall Annex. The form of contract and bonds may be obtained at Room 715, City Hall Annex.

A. ALBERT CHERASHORE
Procurement Commissioner

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3940) will be received at Arapahoe, Nebraska until May 14, 1953, for furnishing labor and materials for earthwork and structures, Cambridge Canal, Station 1574/29 to Station 2607/93, Laterals, Sublaterals, and Drains, Cambridge Unit, Frenchman-Cambridge Division, Nebraska, Missouri River Basin Project. Location in the vicinity of Oxford and Orleans, Nebraska. Principal items are 688,000 cu. yds. excavation; 3,600 cu. yds. concrete; 27,000 lbs. gates and metalwork; 21,000 lin. ft. concrete pipe; Orleans siphon; and other work. Completion time part 360 and part 570 days. For particulars, address Bureau of Reclamation, Arapahoe, Nebraska; or Building 53, Denver, Federal Center, Denver, Colorado.

FRED G. AANDAHL, Assistant Secretary
for Water and Power Development
Department of the Interior

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3937) will be received at Palisades, Idaho until 10 a.m., M.S.T., May 19, 1953, for furnishing labor and materials for: Snake River Bridge Superstructure, Relocation of Wyoming State Highway U. S. 89, Palisades Reservoir, Palisades Project, Idaho. Location: near Alpine, Lincoln County, Wyoming. Principal items are: furnishing and erecting 890,000 lbs. structural steel; and other work. Completion time 660 days. For particulars, address Bureau of Reclamation, Palisades, Idaho; or Building 53, Denver Federal Center, Denver, Colorado.

FRED G. AANDAHL, Assistant Secretary
for Water and Power Development
Department of the Interior

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SALES EXECUTIVE—Manufacturer of steel joists, deck and culvert pipe; steel fabricator of structural, reinforcing and miscellaneous iron; warehousing of related steel specialties. Operation 9 southwestern states; present volume 3000 tons monthly. Position requires promotion of products to architects and engineers, and selling to contractors and owners. Prefer man 35 to 45 years. Excellent opportunity for experienced producer. P-7357, Engineering News-Record.

POSITIONS VACANT

ESTIMATOR OR Engineer—Must be experienced in heavy construction, for general contractors' office in metropolitan New York area. Furnish complete data regarding qualifications and experience. P-7553, Engineering News-Record.

WANTED—ENGINEERS experienced in water works, sewers, paving, buildings, for design and supervision of construction. Advise education, experience, salary requirements, and when available. P-7314, Engineering News-Record.

CONSTRUCTION SUPT.—Thoroughly experienced in pile driving and bridge construction. Only exceptionally qualified men need apply. Give age, detailed record, references and salary. Middle east location. P-7636, Engineering News-Record.

QUANTITY SURVEY Engineer for Plumbing Contractors office, experienced man capable of assuming responsibility for both estimating and supervising installation of plumbing and associated work on all types of projects. This is an exceptional opportunity for the right man with an old established Plumbing concern in Connecticut. When replying, state experience, references, education, marital status and salary details. P-7603, Engineering News-Record.

(Continued on page 92)

WANTED

An Alert Mechanical Engineer with Some Knowledge of Electrical Engineering . . . Must Be a Good Calculator . . .

PHILIPS & DAVIES, INC.
KENTON, OHIO

CONCRETE PIPE SUPERINTENDENTS
CAST SUPERINTENDENTS
First class opportunity with a financially well-established national organization. Require high calibre, experienced men who can supervise manufacturing operations, take complete charge of large field projects.
P-7707, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED
LAND SURVEYOR
with New York or Connecticut license for land surveyor's office in southern Connecticut. Opportunity.
P-7545, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

UNDISPLAYED RATE

$1.50 a Line, minimum 3 lines. To figure advance payment count 5 average words as a line.
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POSITION WANTED and Individual Selling Opportunity Wanted undisplayed rate is one-half of above rate, payable in advance.
Box Numbers in care of our New York, Chicago and San Francisco Offices count as one additional line.
SEND NEW ADVERTISEMENTS to Address N. Y. office, 330 W. 42nd St., N. Y. 36, N. Y., for May 14th issue, closing May 4th.

Replies are forwarded each day as received at each of the offices mentioned without additional charge.
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED RATE

The advertising rate $17.10 per inch for all advertising appearing on other than a contract basis. Contract rate quoted on request.
An advertising inch is measured ⅞ inch vertically on one col. 3 col.—30 inches to a page. E.N.R.

DIRECTOR OF ENGINEERING

Building Materials

A well-known Middle Western manufacturer of structural clay and concrete products wants a man between 35 and 50 to take charge of its product development program. Would be responsible for recommending new products to the company, conducting the necessary engineering development work, recommending appropriate facilities and supervising their installation. Would also be responsible for formulating and directing the sales program on new products. Work will be in the structural clay products, lightweight aggregate and precast concrete products fields. Must have good business judgment and an understanding of the construction industry, its problems and the methods and materials it uses. Must be able to sell and to develop and direct sales engineering activities. A good engineering and/or architectural background is necessary and it would be desirable to have considerable knowledge of plant engineering problems. The opportunity is excellent. Would report to the president and, if successful, may look forward to a general management position. Your reply will be held in confidence.

P-7695, Engineering News Record
520 N. Michigan Ave., Chicago 11, Ill.

SENIOR STRUCTURAL ENGINEER

Age 35-45. Degree required.

Minimum ten years experience in design of bridges and heavy reinforced concrete structures. Previous experience in supervisory position essential.

STRUCTURAL DESIGNERS

Age 30-40. Degree required.

Minimum six years experience design of bridges and heavy reinforced concrete structures.
40-hour week
Paid Vacation
Paid Hospitalization and Insurance Program
Paid Company Retirement Program

Submit complete resume of education and experience, salary requirement, references, and availability date with first letter.

P-7704, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

SUPERINTENDENTS

with substantial experience in

CONCRETE PIPE PRODUCTION

Nationally known producer of concrete pipe offers several exceptional permanent positions to experienced field men capable of supervising manufacture of concrete pressure and non pressure pipe throughout the United States. Also several openings for top-notch master mechanics preferably with previous experience on pipe machinery.

This reputable, well established Company is prepared to offer to the right men life-long secure positions, unparalleled opportunities for growth, personal recognition for individual accomplishments, generous company benefits in addition to high starting wages.

Only men eager and able to get results need apply.

P-7597, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

GENERAL SUPERINTENDENT

Qualified to take charge of field operations in industrial building department with General Contractor operating in the Southeastern States. Annual volume of business in excess of 25 million. Applicant must be a graduate engineer with good personality, able to conduct business with clients and have successful record as superintendent on heavy industrial construction and installation of equipment, with experience on Pulp and Paper Mills, Cement and Fertilizer Plants. Excellent salary.

P-7631, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

SANITARY ENGINEER

Chief Sanitary Engineer to assume complete charge of department handling water supply, treatment and distribution and sewage collection and treatment projects for a down-state Illinois, well established, financially stable firm of Consulting Engineers. Must have ten years' experience and be licensed Structural Engineer in Illinois or able to be so licensed quickly. Starting salary $10,000 and up to attract highly qualified engineer. Send full details on experience and training in first letter. Photo optional. Replies will be treated confidentially. Principal will interview applicants anywhere.

P-7632, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ESTIMATORS

Young engineers capable of mechanical estimating for construction of refineries, steam power and similar industrial projects. Must have some field experience. Considerable weight given to ambition, intelligence and interest in estimating and cost analysis.

BECHTEL CORPORATION
220 Bush Street
San Francisco, California

STRUCTURAL ENGINEER

With 10 to 15 Years Experience in Reinforced Concrete and Structural Steel Design for Electric Utility Work. *Write to* Structural Engineer

PENNSYLVANIA POWER & LIGHT CO.
Allentown, Pa.

POSITIONS VACANT

(Continued from page 91)

ASSISTANT CITY Engineer for City in Central Wisconsin. Graduate civil engineer with some experience in Municipal work desirable. In first letter state age, experience, salary desired, etc. P-7646, Engineering News-Record.

WANTED GENERAL Foreman or Superintendent in Philadelphia and vicinity. Must be experienced in cofferdam and concrete outfall and reconstruction of sewers. State salary, experience and when available. P-7651, Engineering News-Record.

BOROUGH ENGINEER, Pottstown, Pa. Graduate civil engineer, registered in Pennsylvania, with about ten years' experience, heavy on municipal engineering with extensive field and office experience in precise plane surveying. Age 32 to 36. Salary open. Apply promptly to Horace B. Gulden, Borough Manager.

ASSISTANT TO Borough Engineer, Pottstown, Pa. Previous experience in field and office engineering required to perform work and assist the Borough Engineer in his duties. Minimum requirements: college graduate and two years practical experience or in lieu thereof, ten years practical engineering background. Age 24 to 30. Salary commensurate with experience. Apply promptly to Horace B. Gulden, Borough Engineer.

MIDWEST ENGINEERING Firm needs Civil (Sanitary), Electrical, Mechanical and Architectural Engineers. Permanent. Furnish education, marital status, salary requirements, availability. Central Engineering Corporation, Northern Hotel Building, Williston, North Dakota.

ESTIMATOR—PERMANENT position in Central New Jersey experienced on Miscellaneous Steel and Plate Work. Advise qualifications, past employment and salary expected. Write P-7670, Engineering News-Record.

SUPERINTENDENT OR Estimator, graduate in Civil Engineering and two years Mechanical Engineering—13 years field experience in Power, Sewerage, Water and Chemical Plants, also Pulp Mill and Commercial Building. Desire a change from present position. P-7656, Engineering News-Record.

WANTED: GRADUATE Engineer with at least 5 years' experience, preferably in municipal engineering. Good opportunity for engineer wishing to make a career of municipal engineering and administration. Location New York-New Jersey metropolitan area. Please state full qualifications, experience and salary requirements. P-7672, Engineering News-Record.

CONSTRUCTION SUPT., N. Y. public works. Must be pusher. Good salary & future. Replies strictly confidential. Complete resume to P-7680, Engineering News-Record.

TEACHING POSITION—Engineering graduate, Industrial and teaching experience desirable. Opportunity to work on advanced degree. Salary depends upon qualifications. Write: Head, Department of Engineering Drawing, Iowa State College, Ames, Iowa.

TRANSIT MAN—For inside and outside work. Must have thorough knowledge of engineering, drafting and calculating, and be thoroughly familiar with deed and conveyance work, and tax maps. Apply—Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J. Phone Wo 8-1200, Extension 7.

COMPUTOR, DRAFTSMAN and general office man; experience in subdivision and property surveys for an 88 year old firm. Joyce Company, 802 Chestnut St., St. Louis, Mo.

(Continued on opposite page)

ASSISTANT CHIEF CHEMIST and CHEMIST

for large copper company Chile, South America. Must be experienced in analytical work of all kinds, including complete analysis of ferrous and non-ferrous metals etc. Three year contract. Transportation both ways and salary while traveling paid by Company. In reply give complete details.

P-7564, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

SALES ENGINEER

Old reliable engineering and construction company located in Pittsburgh, Pennsylvania, needs sales engineer. Permanent employment, best working conditions, excellent advancement opportunities. Give complete details in first letter such as age, education, experience and salary expected.

P-7643, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT
(Continued from opposite page)

CHIEF OF Party—Must be capable of handling survey parties and have thorough understanding of survey work pertaining to rights of way, curb and street line, sanitary and storm sewer surveys, and a thorough knowledge of general survey work. Apply—Howard Madison, Township Engineer, 1 Main Street, Woodbridge, N. J. Phone Wo 8-1200, Extension 7.

PURCHASING AGENT—Company engaged in general contracting, ready-mix concrete, building materials, and concrete block manufacturing. Location: North Georgia. Reply stating experience, education, age and salary requirements within application. P-7705, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

SALESMAN WANTED—Steel specialties promotion and selling doors, windows, joists, deck and related items for commercial and residential construction. Qualifications desired: Graduate in architecture or engineering; age 28 to 35 years; good mixer and energetic. SW-7398, Engineering News-Record.

EMPLOYMENT SERVICE

WANTED-ENGINEERS, Designers, Draftsmen-Structural, Piping, M.E., C.E., E.E. and Industrial, also Teachers and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

SALARIED PERSONNEL, $3,000-$25,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

EXPERIENCED ARCHITECT'S Superintendent available June 1st desires position within 100 mile radius of Philadelphia, Pa. PW-7525, Engineering News-Record.

CIVIL ENGINEER-graduate, registered. Fifteen years exp. in design, spec. and plan review, and adm. Desire position in adm. capacity. Min. $650. PW-7706, Engineering News-Record.

GENERAL SUPERINTENDENT — Graduate Engineer-Estimating, bidding, field supervision. Commercial, industrial and residential buildings. Presently employed, desire change. PW-7684, Engineering News-Record.

CIVIL ENGINEER—28 married. 4 years varied design and construction experience. Desires position with responsibility in sales engineering or allied fields. Will relocate. PW-7661, Engineering News-Record.

ESTIMATOR, CERAMIC tile, experienced in residential, schools, commercial and industrial work. Robert Ilaria, 282 Clifton Ave., Newark, N. J. HU 2-0151.

PRESTRESSED CONCRETE

Executive Professional Engineer seeks new association. Has broad civil engineering and structural concrete experience of which more than seven years in responsible charge of engineering with firm specializing in prestressed concrete design and construction.

PW-7728, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

STRUCTURAL ENGINEERING
ARCHITECTURAL ENGINEERING

OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. *Forty-third year. Write today.*

WILSON Engineering Corp.

College House Offices—HARVARD SQUARE, CAMBRIDGE, MASS.

POSITIONS WANTED

CIVIL CONSTRUCTION, Irrigation & Drainage Engineer-Graduate Engineer. Thirty-five years diversified and progressive experience in technical administration, planning, investigation and supervision over heavy construction works. Recently completed foreign assignment investigating a project in Central America. Interested in position with major construction company or consulting engineering firm. PW-7685, Engineering News-Record.

CHIEF AUDITOR — Assistant Controller — Twenty-five years experience on large heavy, industrial, ordnance, atomic, cost plus and other type construction projects. Executive ability to organize joint ventures, cost plus, finances, subcontracts and costs any size project. Top references and bond, now employed, available inside thirty days. PW-7658, Engineering News-Record.

ENGINEER-ESTIMATOR, 1946 Civil E. graduate, registered professional engineer. Experience estimating, construction, costs, structural design. Desire position in Florida or South-East. Present salary, $6900. PW-7660, Engineering News-Record.

OHIO LICENSED Construction Engineer. Thirty years experience. Prefer Sewage or Water Plant Construction. Available May 15th. PW-7669, Engineering News-Record.

PART TIME WORK WANTED

STRUCTURAL ENGINEER, licensed, 25 years buildings, foundations, industrial plants, waterfront structures, desires part time work. PTWW-7709, Engineering News-Record.

SELLING OPPORTUNITY WANTED

SALES ENGINEER. Desires to represent manufacturer of equipment used in the treatment of industrial water or waste. RA-7608, Engineering News-Record.

BUSINESS OPPORTUNITIES

Wanted Partner with ample financial resources for general contracting business in Florida. Active or Inactive. Have everything necessary but ample capital. Stand rigid investigation. Inquiries invited. BO-7533, Engineering News-Record.

Active Civil Engineering and Surveying Practice for sale to competent party. Fast growing central Florida coastal city. Vicinity population 50,000. Office, Records and equipment complete. Owner must retire account health. Bo-7696, Engineering News-Record.

FOR SALE

For Sale, Gurley 6" needle compass, Declination arc, standard slit sights, extra pair, slit and hair, plain telescopic sight attachment with stadia wires, fits either pair of sights, early new extension tripod. An unusually complete compass in good condition and fine appearance. Accessories. Price $100. James L. Davis, Fairlee, Vt.

SALES ENGINEER

High volume record—excellent Contacts wants manufacturers representation North Atlantic States or Metropolitan, N. Y.

RA-7682, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

FOR SALE IN FLORIDA
SURVEYING BUSINESS

Established 30 years. All instruments, equipment, notes, photostats and blueprints, needed to continue business. Sale due to death of owner. Price $8,000.

BO-7668, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

SETTLED

Commercial and Industrial Concrete Floors and Airport Runways Raised and Stabilized by Hydraulic Pressure.
15 yrs. experience

LEE AND COMPANY
4545 De Tonty St. Louis 10, Mo.
Lee Gorell, Mgr. Mohawk 4414

SUPERINTENDENTS AND PROJECT MANAGERS TRAINING COURSE

All instructions by mail. Send today for sample lesson and complete details

Geo. E. Deatherage & Son, Dept. 101
411 S. 5th Ave. Lake Worth, Florida

WANTED FOR EXPORT
3 GALION GRADERS

Model 101D—complete—any condition —and used spare parts.

W-7722, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

BANKRUPTCY AUCTION SALE

U. S. District Court, E. D. of N. Y.
Sell Wednesday May 6th at 11 A.M.
97-11 98th Str., Ozone Park, N. Y.

Bucyrus-Erie ¾ yd. Gas. Comb. Crane & Shovel Crawler #1030
Bucyrus Caterpillar Steam Pile Driving Crane #30B
Osgood Caterpillar Steam Pile Driving Crane #29
All 3 with 45' Booms. 2 #1 & #2 Vulcan, and McKiernan-Terry #9B2
Steam Pile Hammers, 2 Sets Steel Pile Driving Leads 54' long
Lincoln Welder, Comb. Electric Chain Saw & Cable, etc.
Inspection on Tuesday, May 5th, from 9 A.M. to 4 P.M.

CHARLES MEYER, *Auctioneer*
William S. Brown, Trustee, 261 Broadway, N.Y.C.
Re: Assets of Daniel J. McCarron, d/b/u firm name of Aqueduct Pile Driving Co.; Bankrupt.

FOR SALE—BARGAIN

1—Northwest Model 6 Shovel Attachment, late model, used 2 weeks.
1—Northwest Model 5 or 6 Shovel Attachment, riveted boom.

BOTH FOR $3,375.00

TYLER-PREUSSER, Inc.
900 West St., Pelham Manor, N. Y.
Pelham 8-3600

FOR SALE
NEW BAILEY BRIDGE

Complete with all planks and accessories attractively priced for a quick sale. Call, wire or write

W. SILVER
1720 Magoffin Ave. El Paso, Texas

FOR SALE
1 KOEHRING MODEL 34E1A PAVER,
Serial 22221, with full length traction, with General Motors Diesel Engine, completely rebuilt, in excellent operating condition, available for immediate delivery. Price, F.O.B. Cars, St. Louis, Mo.: $23,000.00.
For further information call or write
ALLIED CONSTRUCTION EQUIPMENT CO.
4015 Forest Park Ave., St. Louis 8, Mo.
Telephone: Franklin 1818 or 7132.

USED BARBER-GREENE TAMPING, LEVELING FINISHER

Excellent condition

500 Kensington Ave., Meriden, Conn.
Tel. Meriden 71189

Brand new 34E Dual Drum Foot Paver—671 GMC Diesel Motor—700 Gallon Water Tank—Never Used. F.O.B. Cars, Kirkwood, Missouri.

$27,500.00

MACHINERY, INC.
5081 Manchester St. Louis 10, Mo.

STOCK SPECIALS

For Sale or Rent

1—P & H Model 855 Crawler Shovel, 2 yd. capacity, Cat. Diesel power. Reconditioned. Crane boom available.

1—P & H Model 700 Crawler mounted Crane, 1½ yd. capacity. Gas power. Good all-around condition.

1—Marion Model 342 Crawler mounted Shovel and Crane, 1 yd. capacity diesel engine. Excellent operating condition.

1—Osgood, 1 yd. Crawler Hoe & Crane, 50' boom. Gas Power. Good Condition.

1—Koehring Model 301 ¾ yd. Crawler Crane, 50' boom. Serial #1277. Very good used condition.

1—Bay City Model 45 ¾ yd. Crawler Hoe-Shovel-Crane. Late model in perfect condition. Cat. D318 or GM Diesel power.

1—Buckeye Model 70, ¾ yd. Crawler Hoe & Shovel. Late model. Diesel power.

1—Byers, Model 83, ¾ yd. Crawler Hoe or Crane, gasoline power. Rebuilt.

1—Link Belt Speeder Model D-4 Crawler Crane, 35 ft. boom, 16" crawler shoes, Cat. D-7700 engine. Reconditioned.

1—Bay City Model 30, Heavy Duty ½ yd. Crawler Shovel or Hoe. Gas power. Reconditioned.

1—Bay City Model 25, ½ yd. Crawler Hoe or Shovel. Late Model. Gas power. Rebuilt.

1—Bay City Model 15-T-40 Cranemobile ½ yd. capacity. Late model. Excellent condition. Hoe attachment available.

1—Bay City Model 15A T 40 Cranemobile, ½ yd. 10-ton capacity. Magnet & Generator set available. Good all around condition. Hoe attachment also available.

1—Browning Truck Mounted Crane 10 ton capacity Model "E," powered by Cummins diesel and mounted on 10 wheel Mack chassis. First class condition throughout.

1—Universal Truck Crane, 28 ft. boom, mounted on A. C. Mack Chassis. Single axle rear.

1—Bay City Model 65 or 650 Trench Hoe Attachment with 42" cutting width bucket. Practically new.

1—Bay City Model 65 or 650 Shovel Attachment with 1¼ yd. shovel dipper. Practically new.

1—P & H 255A Hoe Attachment. Practically new.

Clamshell Buckets, ⅜ to 2 cu. yd., also several Crane Booms—Trench Hoes and Shovel Attachment — Assorted makes.

1—D-8 Caterpillar Tractor 1-H Series with Hydraulic Bulldozer, also D.D. P.C.U. 22" Shoes, with new set of tread pins & bushings, sleeves, pistons, rods, main bearings. Very reasonably priced.

Check on what you may require.

EUGENE P. READING, INC.
Walnut St. & B. & O. R.R.
Roselle, New Jersey
Chestnut 5-0200—New Jersey

FOR RENT

New Model 3500 Speederane, dragline, clamshell and lifterane, 60-ton capacity.
New Ingersoll Rand 600' Gyro-Flo Air Compressor.
New Lorain Truck Crane, 25 Ton capacity.

FOR SALE OR RENT

Marion 392 and Koehring 803 dragline, clamshell, lift crane and pile driver combinations. McKiernan-Terry 8-S and 11B-3 Pile Hammers.

Reply to:

Clemens Construction Co.
P. O. Box No. 266, West New York, N. J.

FOR SALE

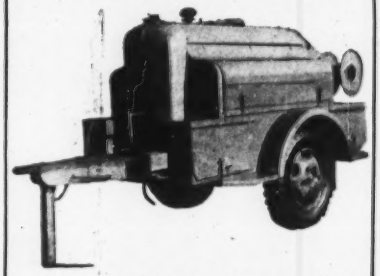
20,000' of 3 Conductor 2/0 Steel Taped Parkway Cable, Type RJFJ, 3000 V.
3,500' of 3 Conductor #2 Steel Taped Parkway Cable, Type RJFJ, 3000 V.
2—45 KVA, 2400 V. Primary 480/240 V. Secondary, 3 Phase, Dry Transformers
2—75 KVA, 2400 V. Primary 480/240 V. Secondary, 3 Phase, Dry Transformers
5—112½ KVA, 2400 V. Primary 480/230 V. Secondary, 3 Phase, Dry Transformers
3—100 KVA, 2300 V. Primary 460/230 V. Secondary, Single Phase, Oil Cooled Transformers
3—50 KVA, 2400 V. Primary 480/240 V. Secondary, Single Phase, Oil Cooled Transformers
3—100 KVA, 2400 V. Primary 480/240 V. Secondary, Single Phase, Oil Cooled Transformers
50—Misc. 2, 3, 5 & 15 KVA Single Phase Transformers. Also numerous switches, metal switch cabinets, 50 and 100 amp. cutouts, circuit breakers, etc.

Subject to prior sale

FRAZIER-DAVIS CONSTRUCTION COMPANY
1319 Macklind Avenue, St. Louis, Mo. STerling 1950
Box 135—Grahamsville, New York Grahamsville 2861

Can't Beat This Compressor for $1900

10 in Stock for Immediate Shipment



105 CFM INGERSOLL RAND PORTABLE

- Oil Engine Driven
- Two Stage
- On (2) Pneumatics
- Electric Starter
- Built in Tool Boxes
- (2) Live Hose Reels

Guaranteed the same as NEW. Inspect them—see them run. Try one for 30 days. Buy or Rental Purchase.

AMERICAN AIR COMPRESSOR CORP.
Dell Ave. & 48th St. North Bergen, N. J.
Union 5-4848

FOR SALE

1—Lorain Mdl. L50J Lifting Crane with 60' boom, pendant suspension, 15' jib with Caterpillar D-318 diesel engine. Machine 2 years old. Very good condition. RSP-194 (B)
SALE PRICE F.O.B. PADUCAH, KY. $14,000.00

1—Lorain Mdl. #77 Shovel w/2 cu. yd. Amsco Bucket. Caterpillar diesel engine. $3800.00 in repairs since use. S-2184 (B)
SALE PRICE F.O.B. LOUISVILLE, KY. $13,900.00

1—International Mdl. TD-24 Crawler Tractor w/Bucyrus-Erie P-28 double drum power control unit. S-2235 (C)
SALE PRICE F.O.B. LOUISVILLE, KY. $8,500.00

SYMBOLS
A—Almost new or rebuilt & guaranteed
B—Reconditioned—good running order
C—Fair "As Is"

LOUISVILLE MIDDLESBORO BRANDEIS EVANSVILLE PADUCAH
BRANDEIS MACHINERY & SUPPLY COMPANY, INC.
LOUISVILLE Since 1908 KENTUCKY

Crane & Shovel ATTACHMENTS

1—55' Crane Boom for 1½ Yd. Bucyrus-Erie
1—35' Clam Boom for Model 255A P & H
1—Shovel Front for Model 255A P & H
1—Shovel Front for Model 2 Northwest
1—Shovel Front for Model 25 Northwest
1—Hoe Front for Model 25 Northwest
1—Shovel Front for ½ Yd. General
1—Hoe Front for Model L-41 Lorain
1—Fairlead Only for Model L-41 Lorain
1—¾ Hendrix Dragline Bucket
1—⅜ Owen Type M Clam Bucket

SPECIAL

1—⅜ Yd. Model 31 HANSON Trench Hoe (1950). New Motor. Very Good & Clean

THE PATTERSON EQUIPMENT CO., INC.
6195 Brecksville Rd. Independence, Ohio
Phone Cleveland—LAfayette 4-3371

100 TON STIFFLEG DERRICK

175' boom. Mast 74'5". Legs 105'6". Sills 75'9". 30' bullwheel. With 200 HP 3 drum electric hoist 3/60/440. With 30 HP Independent elec. swinger.

Derrick will lift 12 tons at 178' radius.

MISSISSIPPI VALLEY EQUIPMENT CO.
509 Locust St. St. Louis 1, Mo.

GENERATORS—DIESEL

1—20 KW I-H UD-9 1/60/120/240
2—25 KW I-H UD-9 1/60/120/240
2—30 KW I-H UD-14 3/60/121/220
1—60 KW G.M. 6016-E 3/60/127/220

Rental or Sale *One New

DIESEL MOTORS COMPANY
Port Washington, N. Y. PO 7-2000

LOCOMOTIVE CRANE: Link Belt 25 ton capacity, standard R.R. gauge, gasoline powered, cast steel trucks, air brakes, with or without 1¼ yd. Williams clam shell bucket, thoroughly modern, excellent condition. Located Minnesota. For sale or rent.

CAR DUMPER: Link Belt, will dump standard R.R. gondola cars up to 90 tons capacity, transfer table 54'. Specifications and photos available.

COMPRESSOR: Worthington DC2, 29/18-½ x 21, motor 600 H.P. synchronous, 440 volt, with all auxiliary equipment.

BUCKET: Blaw Knox type W730, 2½ yd. clam shell, new condition.

DIESEL MOTOR: Caterpillar D13000 portable on skids, 122 H.P.

HOIST SPECIALS: 1—Single drum, all steel, 10' dia., 6" face, 1¾" rope, 600 FPM, 900 H.P., 82,000 lbs. working load. 1—Double drum 10' dia., 1200 ft., 1⅞" rope, 1400 FPM, 1200 H.P. 1—Vulcan, double drum, 200 H.P., 8' dia., 4' face, one drum clutched. 1—Single drum 250 H.P., 5'6" dia., 46" face, 1-¼" rope. All the above with all auxiliary equipment. Other Hoists 100 H.P. to 1050 H.P., single and double drum, with electrical equipment.

WE BUY AND SELL EQUIPMENT THROUGHOUT NORTH AND CENTRAL AMERICA

A. J. O'NEILL
Lansdowne, Pa.
Phila. Phones: MAdison 3-8300—3-8301

FOR SALE
Used—Immediate Delivery

TD-24—TRACTOR with Bucyrus-Erie Cable. Bulldozer
Late Model—Reconditioned and Guaranteed

BROWNING 17½ Ton Truck Crane
LINK-BELT 20 Ton Truck Crane
LORAIN 1 Yd. Gas Crawler Shovel
HOUGH HFH ¾ Yd. Payloader
TD-9 with Bucyrus-Erie Hyd. Bulldozer
T-9 with Bucyrus-Erie Hyd. Bulldozer
TD-14 with Isaacson Hyd. Bulldozer
T-14 with Isaacson Hyd. Bulldozer
TD-18 with Bucyrus-Erie Hyd. Bulldozer
MARION ⅝ Yd. Gas Crawler Shovel
NORTHWEST ⅝ Yd. Gas Crawler Crane Hoe
JOY 315 Gas Compressors
CASE Tractor with Lull Loader
CATERPILLAR D-4 Tractor with Loader
HOUGH HF ¾ Yd. Payloader
SCOOPMOBILE

UNION, N.J. U.S. 22 Unionville 2-7400
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WESTBURY, L.I. JERICHO TPK Westbury 7-5000

FOR SALE
New Wire Rope Blocks

12" Snatch Blocks with Hooks	$13.50
14" Snatch Blocks with Hooks	18.50
16" Safety Snatch Blocks with Shackles	20.00
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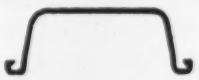

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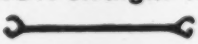

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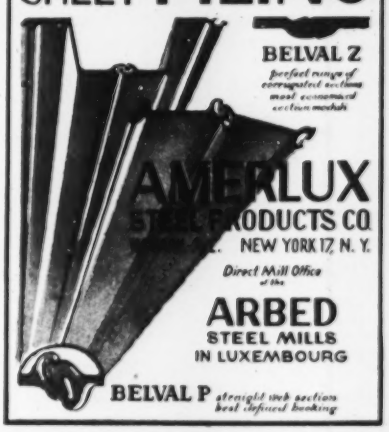

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LARGER LEGAL GROSS LOADS of heavy concrete mixer and other over-the-highway trucks are made possible by adding a second front axle.

Four-axled truck boosts payloads

Higher loads remain legal when distributed to extra axle in dual steering tandem front end

How to carry more payload yet stay within legal limits on axle loadings is a continual challenge to truck operators who use the highways. The Chain Belt Co. thinks it has the answer in its new Rex-Spangler dual steering tandem front axle.

• **Five to seven tons more payload**—The actual amount of payload made possible by the extra axle depends on the type of truck involved and the legal axle and gross weight limitations of the state or city in which it is operated. It is said that a conventional three-axle truck-mixer carrying five cu yd of concrete could carry an additional 30% payload by adding the second front axle. And in some instances, according to the manufacturer, as much as five to seven tons more payload is possible.

• **Construction**—The unit is made up of two tandem front axles. They are spaced 55 in. apart and are joined together by a pair of walking beam assemblies having center pivots that provide free articulation of all four front wheels.

The walking beam assemblies are attached to the axles through a pin joint and a heavy steel bracket bolted to the axle pad. This pin joint in conjunction with the center pivot of the walking beam permits the elevation and depression of each wheel. The four pin joints, one at each wheel, and the beam and center pivot assemblies constitute the upper tie between the two axles. Four torque rods form the lower tie to keep the axles aligned. These torque rods have ball sockets at either end permitting free movement for the deflection of the axles and still maintaining the stability of the axle.

The truck frame is supported on the dual axle assembly by rubber paraboloids in cylindrical steel mounting brackets. The company claims that these have greater dampening capacity than coil springs and a more uniform deflection can be obtained. On this basis the company says that an unloaded vehicle rides equally well as one that is loaded.

• **Here's how it steers**—Steering power, whether it be manual, hydraulic or air boosted, actuates a pitman arm and drag link system to turn the front wheels a greater amount than those on the second axle. The pitman arm is pivoted from the bottom, and drag link connections to front and second axles are pinned to this arm at different elevations. By proper location of the drag link connections on the pitman arm and to the steering arm balls on the axle, the proper turning angle for each axle is automatically established.

The four-wheel assembly can be steered manually, but if additional steering capacity is necessary, a power steering system can be added. This system may be an air power booster or a hydraulic booster unit.

• **Safe operation**—The Rex-Spangler unit has several advantages over the conventional single front axle, according to its manufacturers. Aside from the fact that the addition of a fourth axle to a standard three-axle truck permits substantially a greater gross load—and consequently a greater payload—the fourth axle is said to provide greater truck stability. Centerpoise steering of the unit also reduces driver fatigue by absorbing the shocks normally transmitted through the steering wheel. It is further claimed that the tendency to skid on curves is considerably reduced since the tractive power of the front end is doubled. All four wheels have air brakes.

• **Status of development**—Development of the unit is in its initial stages and has so far been applied to concrete mixers. Plans are being made, however, for the application of these axles to trucks for commercial highway hauling and for heavy truck cranes. CHAIN BELT COMPANY, 4701 W. GREENFIELD AVE., MILWAUKEE 1, WIS.

Air entraining agent sets without volume loss

A new air entraining agent, called Mearlcrete P, can be used to obtain low density concrete and mortar, rigid thermal insulation or light-weight building products.

According to the manufacturer, foamed cement paste made with the agent is stable and sets to a solid foam without decreasing in volume or increasing the setting time. Varying the conditions or preparation of the foam cement makes possible a product with density, thermal conductivity and compressive strength to suit the required need. MEARL MFG. CO., 153 WAVERLY PLACE, NEW YORK, N. Y.

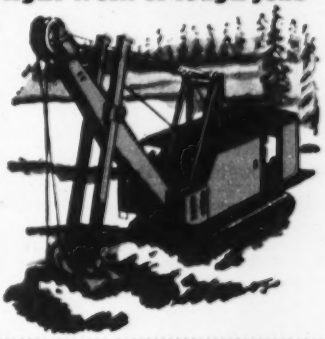
(*New Products continued page* 101)

CUMMINS DIESELS *are engineered to make light work of tough jobs*

Progressive, eyes-ahead engineering is one of the big reasons why so many construction men pick Cummins Diesels for dependability.

Consider Cummins' exclusive system of fuel injection and metering—an important factor in the unequalled performance records established by lightweight, high-speed (60-600 h. p.) Cummins Diesels. No other Diesel fuel system is so simple . . . so rugged! It delivers a uniform, properly prepared fuel charge to every cylinder. All under low pressure—no chance of bursting and leaking fuel lines.

Your Cummins dealer will be glad to tell you more about the exclusive fuel system and other engineering advantages built into every Cummins Diesel. He is an expert who knows the requirements of your job. He heads up a specialized parts and service organization—equipped to handle all your diesel power needs. Call him today . . . or write!



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with Built-In features to save you money

MODEL 1055 — 3½ yards
MODEL 955A — 2½ yards

Strength was no afterthought on this husky machine. It started on the drawing boards — with all-welded construction of tough rolled steels — with extra strength where strength is needed — with the ability to absorb continuous shock loads . . . and the stability to let you use full power for bigger production. It is the steady digging, without time-outs for pampering, that saves you money.

Add smooth hydraulic control to cushion operations and reduce operating fatigue, and you have the built-in advantages to make all kinds of rock work more profitable. The Model 1055 (3½ yard) and the Model 955-A (2½ yard) have proved it. Ask to see one on the job.

P&H MAGNETORQUE*
ELECTRIC SWING

gives you the slickest, fastest cycle you've ever known on machines of this size . . . from 15% to 25% faster than any others! And there are no delays for adjustments or replacement of swing frictions. Magnetorque eliminates all that — and lasts the life of your machine.

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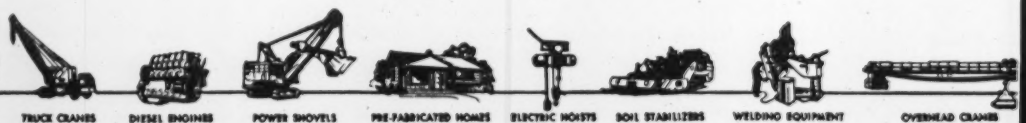

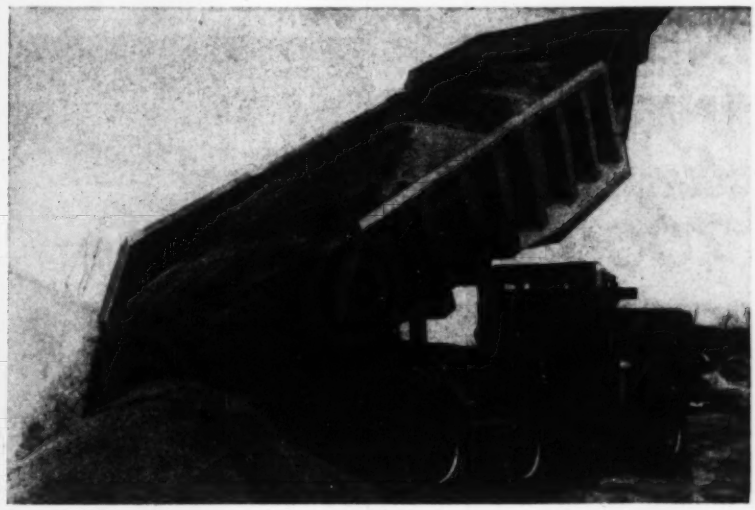

World's largest truck?

Dart 60-ton dump features underslung diesels and power steering of dual-wheeled front end

Measuring 32 ft. 8 in. long, 11½ ft. high and 11 ft. 8 in. wide, it's a lot of truck no matter how you look at it. Too much truck, in fact, for many uses, but its potential utility on big dirt jobs, such as large earth fill dam projects, will make the big contractor give it a careful second look.

• **Twin diesel power**—The truck is driven at a top speed of 20 mph by two 350 hp diesels mounted amidships of the truck's under-belly. This location is said to provide easier maintenance and better weight distribution. The original trucks—delivered to the Bagdad Copper Mines for strip mining operations—were equipped with Buda 8 DAS-1125 diesels, but Cummins NHRBS 600 or Waukesha WAKDS or WAKR may be substituted.

Engines are cooled by two radiators in front of the cab.

• **Torque converter for each axle**—Each engine is connected to a rear axle through separate three-stage torque converters with a torque multiplication factor of 5:1. With the converter there is no gear shift—just a forward and reverse lever.

Each converter is charged with diesel fuel from the fuel tank. This fluid is the working medium through which the converter transmits energy. The converter fluid, that is, the diesel fuel is circulated through a heat exchanger which cools the converter.

The two rear axles, rated at 85,000-lb-capacity each, feature 5:1 reduction through planetary gears. The frame is made up of ⅜-in. side plates and ¾-in. top and bottom plates welded into a full box section 27 in. wide and 19 in. deep. It is reinforced at high load positions for added strength.

• **Dual hydraulic system**—The hydraulic system for steering and hoists is powered by two vane-type pumps with a total capacity of 144 gpm at 1000 psi. A hydraulic pump is attached to each engine to permit operation of the system with one engine stalled.

The twin hydraulic hoists are rated at 130,000-lb push and are equipped with built-in snubber and pull-down. Twin hydraulic boosters for steering provide 56,000 lb steering effort.

• **Floating action suspension**—The front end of the behemoth is supported by an air-hydraulic strut that provides a floating action between the truck and front axle. This suspension system permits the front axle to swing on a center axis much like the front axle of a wagon.

The rear axles are mounted conventionally on somewhat unconventional leaf springs—some of the leaves are 2 in. thick.

The truck weighs about 120 tons gross, 48 tons net, and rides on 18.00 x 25 32-ply Goodyear hard rock lug tires. 9 x 20 in. brakes on all axles give 2550 sq. in. of total brake lining area. DART TRUCK CO., OAK & 27TH ST., KANSAS CITY, MO.

(Continued on next page)

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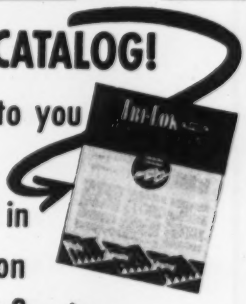

Up to the minute information on the hows and whys of construction and installation of Tri-Lok Open Steel Flooring may now be at your finger-tips. Here is a four-page catalog designed to aid you in selecting the best types and styles of open-steel flooring for your particular construction project.

In This Catalog You'll Find
- Tables of Safe Loads
- Specifications required for open steel flooring installation
- Types of Tri-Lok Open Steel Flooring available
- Information concerning construction, sizes, strength and adaptability of Tri-Lok Steel Flooring

WRITE FOR BULLETIN PW 1102-243

DRAVO CORPORATION
National Distributor for THE TRI-LOK CO.
Fifth & Liberty Avenues, Pittsburgh 22, Pa.

HOW FRANKI FOUNDATION COMPANY Saved Greater Pittsburgh Airport More than $7,000

On foundations for two hangars at the Greater Pittsburgh Airport, Coraopolis Heights, Pennsylvania, it was necessary to install the foundations in boulder-loaded fill. Open caissons and pile clusters were considered for picking up the column loads of 110 design tons.

When the bids were opened, the officials of the County of Allegheny, Pennsylvania, found that Franki Pressure Injected Spread Footings assured a savings of more than $7,000 below the next lowest bidder.

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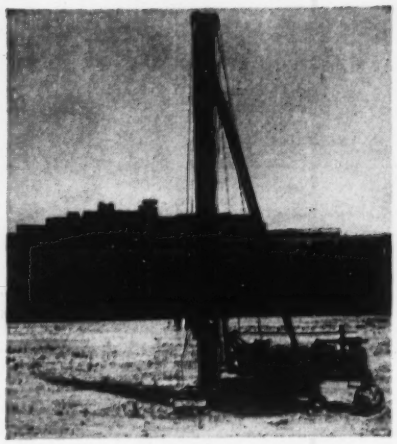

Hangar foundation at Greater Pittsburgh Airport. Franki Pressure Injected Spread Footings from 12 to 40 feet in depth.

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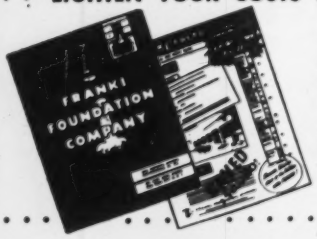

Send for "Franki Facts" for complete information about the Greater Pittsburgh Airport project—and an illustrated booklet describing the Franki Foundation method in complete detail. Write Franki Foundation Company, 114 East Fortieth Street, New York.

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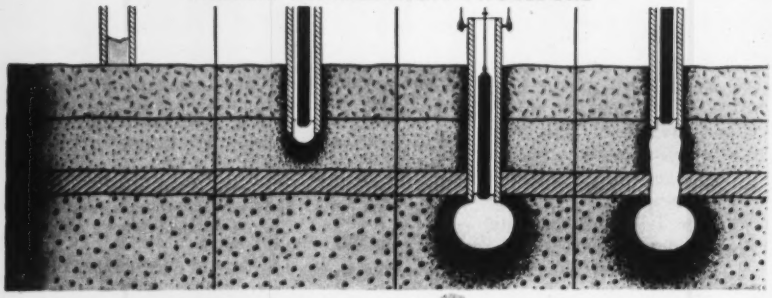

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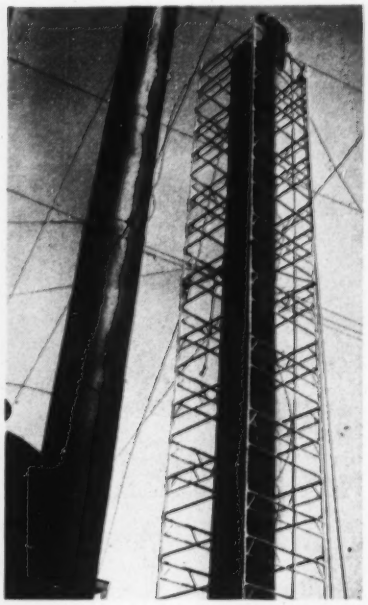


Tubular steel scaffolding cuts erection time

According to the manufacturers, the use of Jagiel "Kwik-Skaf" will permit the erection of scaffolding in a fraction of the time required for conventional practices.

The scaffolding has only two basic parts, a frame and a tie-bar. These two pieces are slip-fitted together and therefore require no bolts, pins or screws. It is said that this method of attachment is sufficiently strong so that the scaffolding need not be completely dismantled in going from one area to another. However, when the scaffolding is dismantled, the compact design of the integral members will permit stacking in a small space and also facilitate transportation.

The scaffolding has been load tested by independent laboratories at better than 400 lb per sq ft. JAGIEL MFG. CO., 415 MADISON AVE., TOLEDO, OHIO.

Westinghouse offers new line of air conditioners

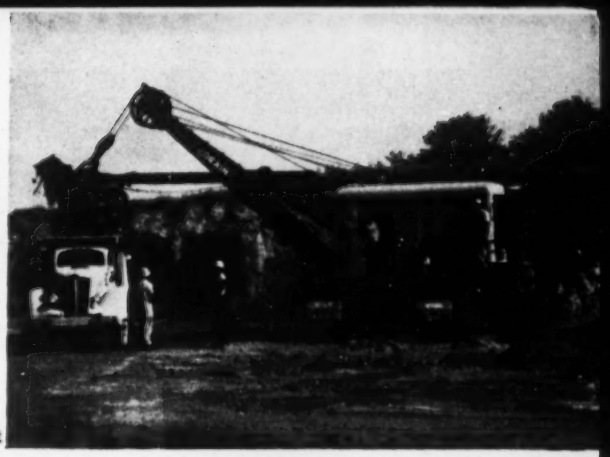
Two new air conditioning units are now available for installations in residential structures. The units, manufactured by Westinghouse, may be used alone or in conjunction with a forced warm air heating system.

A three-hp model, designated the RU-31 Unitaire, stands five feet high and measures 28¾ in. wide by 21⅝ in. deep. It is obtainable with or without fan assembly, with bottom or back

(*Continued on page 105*)

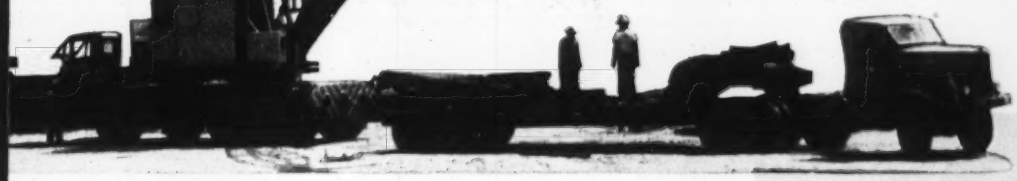
H-BOMB PROJECT

IN SOUTH CAROLINA



1-½ yd. Lorain 79-J shovel loads 2500 yds. of borrow a day.

44 LORAINS work on $1,500,000,000 Savannah River Plant of A.E.C.



The 45-ton Lorain Moto-Crane, Model MC-824, is shown unloading steel.

"The largest industrial project ever undertaken from scratch" describes the history-making H-Bomb material plant in South Carolina. Job facts (at right) challenge the imagination. Construction figures are staggering. 44 Lorains are scattered over the job — doing every conceivable type of work. Lorain shovels, cranes, clamshells, draglines, hoes—on crawlers or rubber-tires — from the 3/4-yard "TL" series up to the giant 45-ton MC-824, world's largest crane on rubber, played a vital role on a vital job.

A ¾ yd. Lorain TL25-J Hoe digs trench for the 85 miles of water lines.

A 20-ton Lorain Moto-Crane, Model MC-414, handles concrete forms.

JOB HIGHLIGHTS

. . . facts and figures

CONTRACTOR — E. I. DuPont de Nemours & Co., prime contractors for design, construction and operation, have purchased a total of 115 Lorains. (All machines shown here are owned by DuPont).

SIZE — Project covers 315 square miles; 105 miles of new roads and 66 miles of permanent railroads constructed; 250 permanent buildings.

MATERIALS — 34,000,000 yards of excavation; 1,250,000 yards of concrete; 75,000,000 bd. ft. of lumber; 25,000 tons of structural steel; 85 miles of underground water lines; 95 miles of power transmission lines.

MANPOWER — 38,223 peak on construction with a $150,000,000 annual payroll; 7,100 permanent staff with a $30,000,000 annual payroll.

LORAINS — 44 Lorains serving prime and sub-contractors; at work on every kind of construction, every kind of material handling, every kind of digging.

Another big job . . . and another big Lorain fleet . . . because Lorains get the call when there are many KINDS of jobs to be filled. SELECTION UNLIMITED of a quality product is the reason why. Why not take a tip from jobs like these and let your Thew-Lorain Distributor fill your needs . . . for EVERY job?

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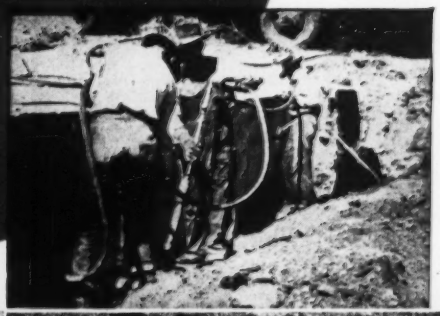

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FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

return air inlet and at compressor motor voltages of 208/220 volts, 60-cycle, three-phase, or 230 volts, 60-cycle, single-phase.

The second unit, a 5-hp model called the RU-51 Unitaire, is available for homes having a heavier heat load. Measurements of the conditioner are only slightly larger than those for the 3-hp unit.

Both models have a hermetically sealed motor compressor unit with a refrigerant cooled motor. Since the unit absorbs its own heat, it may be located in a closet, under a stairway or other out-of-the-way place. WESTINGHOUSE ELECTRIC CORP., AIR CONDITIONING DIV., DEPT. T-099, 200 READVILLE ST., HYDE PARK, BOSTON 36, MASS.

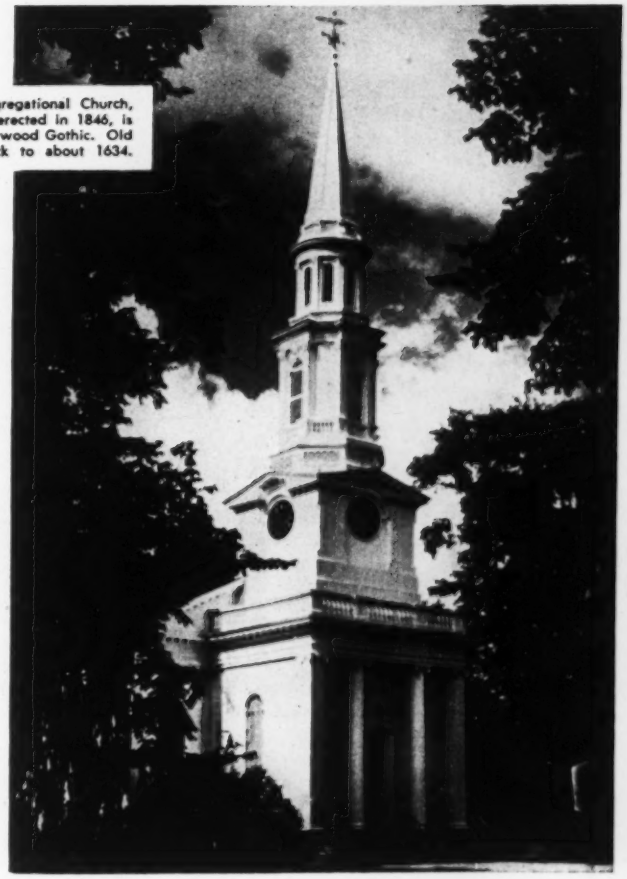
New products briefs . . .

• **Paint-on solder paste,** combined with flux and trade-named Eutec-TinWeld is said to increase speed of application while cutting waste to a minimum, according to Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing, N. Y. The formulation permits application by means of spatula, brush, or dipping.

• **Compressor truck**—The Air Van, a new truck-mounted air compressor assembly, is announced by D. A. Davey Compressor Company, Kent, Ohio. The compressors are mounted on a Fageol Van truck, which is manufactured by Twin Coach Company, of Kent, Ohio. The new compressors are offered in either 105 cfm, or 160 cfm capacities. These compressors are driven from the truck engine to a power take-off installed in the truck drive shaft.

• **Impact tool**—A new electric impact tool manufactured by the Syntron Company of Homer City, Pa., is claimed to provide a fast, easy way to run and remove up to ⅝ in. bolts. With accessories, it can be used also for reaming, screwdriving or drawing, hole sawing, wire brushing, masonry drilling and wood boring. The tool weighs 6¾ lb and is powered by a Universal a-c d-c motor for 115-volt operation.

• **Grease seal**—A new type of grease seal has been developed for use on Caterpillar D-4, D-6, D-7 and D-8 tractors and International TD-24s. It can be obtained from the Sure-Seal Equipment Company, 2424 E. Burnside St., Portland, Oregon. Two neoprene rubber seals are used in place of the single seal.



Old North Congregational Church, Ipswich, Mass., erected in 1846, is rare example of wood Gothic. Old North dates back to about 1634.

Churches of Wood

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Wood's natural beauty is retained and its advantages increased by three popular methods of engineered timber construction — the TECO WEDGE-FIT connector, glued laminated, and Lamella systems. These are widely used in constructing churches, church schools and assembly halls.

Timber trusses and arches, ready to erect, are available from experienced fabricators in all areas of the country.

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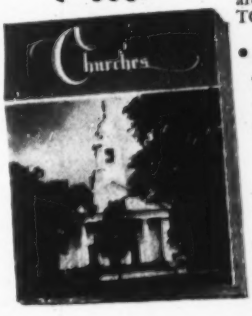
Many outstanding American churches, built of wood, are shown in the 32-page booklet, "Churches". Send TODAY for a FREE copy.



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ENR

Check this 18-yd. bottom-dump

Increases earthmoving efficiency

The new 18 cu. yd. LeTourneau Tournahopper hauls at speeds up to 40 m.p.h. Powered by a 186 h.p. 2-wheel prime-mover, it features fingertip electric controls and 4-wheel, multiple-disc air brakes with 940 sq. in. braking surface per wheel.

A Big target speeds loading

It speeds loading because the shovel or dragline operator aims at a big (7 ft. x 11¾ ft.) target. Independent power steer and 90° turning radius (15 ft. 8 in.) assure fast, accurate positioning under loader and let Tournahopper work in restricted quarters.

B Hauls through footing where other units cannot go

With the flotation of its 21.00 x 25 low-pressure tires, 5½ h.p. pull on each ton of gross weight, and a differential applying up to 4 times more power to the drive wheel on firmest footing, Tournahopper works in weather and footing that stop other haulers.

C Dumps at touch of electric switch

On the fill, dump is controlled by a simple push-button. The clamshell-type gates open electrically at touch of a dashboard switch, wiping clean as they swing high. Gates clear 25 inches. You can dump while unit is in motion or standing still.

Tournahopper, Tournarocker, Tournapull Carryall
Trademark Reg.U.S.Pat.Off.EX 110-b

When scraper dirt is encountered, Tournahopper trailing unit may be interchanged for electric-control 16-yd. Carryall Scraper (above).

Other trailing units available include an 18-ton Rear-Dump (shown above), 20-ton Flat-Bed, 20-ton Crane, and 6-yd. mobile Concrete Mixer.

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Peoria, Illinois

PUBLICATIONS

Clay products—A comprehensive clay products catalog contains complete data, ordering instructions and price schedules for all clay products manufactured by American Vitrified Products Company. The 98-page booklet also lists A.S.T.M. and federal specifications, and installation and purchasing hints. The book is cross-indexed and is intended for use as both a reference and a buying guide. AMERICAN VITRIFIED PRODUCTS COMPANY, NATIONAL CITY BANK BUILDING, CLEVELAND, OHIO.

Stainless steel electrodes—A 20-page catalog describes the complete line of Arcaloy stainless steel electrodes. The booklet also includes an explanation of the two basic types offered—lime coating for all-position welding with DC reverse polarity and AC-DC for welding of chrome-nickel steels. Ask for Bulletin AR53-16. ALLOY RODS COMPANY, YORK, PENNSYLVANIA.

Power distribution—A new program instituted by the General Electric Company presents 12 ideas intended to help industrial plants maintain power continuity, reduce installation and operating costs, safeguard personnel and equipment and plan modern flexible power systems. Included in the program is a slidefilm called "The Vital Link" that will be shown to those interested. Also available are a 28-page power distribution manual and allied literature with additional product information. GENERAL ELECTRIC COMPANY, SCHENECTADY 5, N. Y.

Steel sheet piling—Contractors faced with the problem of selecting proper piling for construction projects might ease their task with a new catalog entitled "Steel Sheet Piling." To help the contractor in estimating a job, one section lists the number of piles required for various wall lengths. Also included in this 20-pager are piling data related to circular and diaphragm-type cellular coffer-dams, Z-piling and other connections, corner pieces and specifications for piling sections. L. B. FOSTER CO., 11 PARK PLACE, N. Y. 11, N. Y.

Explosives and blasting—A 56-page booklet furnishes information on Hercules explosives and blasting supplies. The booklet not only contains a listing of all the company's blasting supplies but also a tabular summary of the properties of these explosives. HERCULES POWDER CO., WILMINGTON, DEL.

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EDITORIALS

Practice of engineering by corporations

BATTLES OVER PROPOSED AMENDMENTS to engineer-license laws generally result in illogical statements and hasty acts that are quite the opposite of the rational approach engineers pride themselves on taking toward questions put before them. The recent fight in New York State over an attempt to write into the state's license law new provisions relating to the practice of engineering by corporations was no exception.

An innocent looking amendment to the state's license law that was passed last year had placed the corporations sponsoring those new provisions in the unhappy position of appearing to be practicing engineering illegally, simply because they had not been organized under New York law prior to 1935. Equity and simple justice were on their side; the amendment they proposed was similar to provisions relating to practice of engineering by corporations in the license laws of more than half the states. Yet the professional engineering organizations of New York State prevented adoption of the amendment by the legislature by attacking it as though it were an attempt to undermine the very foundations of the law itself.

The corporations sponsoring the amendment all are well known in the field of engineering. Officers in responsible charge of their engineering work are licensed engineers. Their only crime—if it can be called a crime—was their failure to be organized under New York State law prior to 1935.

THE NEW YORK STATE Society of Professional Engineers sponsored the amendment that wrote that provision into their law in 1935; yet the society never made any attempt to have it enforced against prominent out-of-state corporations like the Stone & Webster Engineering Corp., presumably because it knew that such a provincial restriction would be declared unconstitutional if attacked in the courts.

That requirement probably would have continued as a "dead letter" had not the society sponsored another amendment last year requiring all corporations practicing engineering in the state to apply biennially for a certificate showing that they were practicing legally, and making it illegal for a corporation not holding such a certificate to practice after March 1 of this year. This latter action compelled the corporations in question to take some action to put their practice on a legal basis. The step they took was a logical one. If they erred, it was in not going to the state society initially to seek its cooperation in getting an acceptable amendment written.

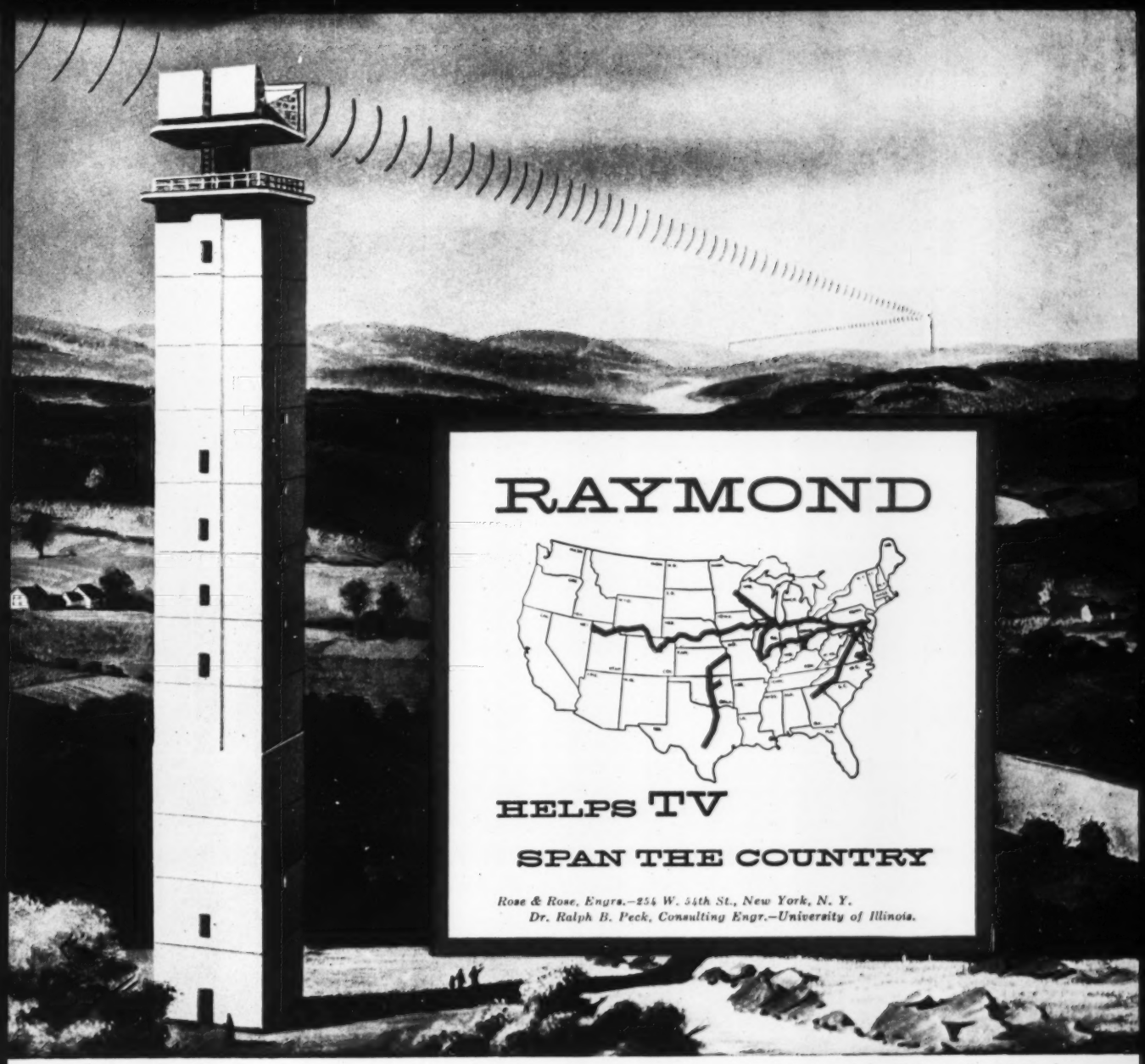
Professional harmony would be advanced if the New York State Society of Professional Engineers should undertake to demonstrate its desire to be fair to the corporations now practicing under a cloud and to the many licensed engineers they employ by taking the initiative in evolving an amendment to the license law that will be acceptable to it and at the same time will restore full legality to the practice of those corporations. Early action might make it possible for such an amendment to be acted on by the legislature at one of the impending special sessions.

If the society does not act to clear up this matter amicably, the corporations directly affected probably will take one of two courses. Either they will attack the constitutionality of the whole section of the license law applying to corporations, or they will claim complete exemption from all provisions of that law on the ground that they are engaged in interstate commerce. Either course appears to have good prospects for being successful. Success of either would weaken the license law more than the amendment the state society succeeded in having killed.

PRACTICE OF ENGINEERING by corporations may have some unfavorable aspects, yet no one of those cited at hearings on the controversial amendment to the New York law appears to be very real or so serious as to make practice by corporations, under such safeguards as were proposed in that amendment, fundamentally unsound. Such questions as which officers and employees of a corporation doing engineering work should be licensed are details that can be worked out around a conference table.

The requirement in a few of the state laws that all officers of corporations doing engineering work be engineers appears to be both unrealistic and unnecessary. Large corporations need both lawyers and financial experts on their boards. Incidentally, much the same thing possibly may be true of some of the larger consulting engineering firms in the future. As they grow in size, they may find it beneficial to advance men trained as accountants or men with unusual executive ability to partnership in the firm. That would not be possible now under most registration laws, for most of them require that all partners be licensed engineers. Nevertheless, so long as all the engineering work of a partnership or a corporation is carried out by and under the direction of licensed engineers, the basic requirement of insuring safe engineering work should be covered adequately.

THESE ARE QUESTIONS of interest far beyond New York State. The legislative fight in New York served chiefly to highlight them and to point to the need for settling controversial questions relating to state license laws around a conference table rather than in a legislative chamber under conditions that are not conducive to logical actions.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Completing another job in record time, the Gow Division of Raymond conducted test borings and made soil investigations for over 150 locations of A. T. & T.'s radio-relay towers which carry television across a major portion of the country. In the accomplishment of this work, Raymond personnel and technique once again played an important part in an outstanding achievement.

Making Gow test borings for one of the towers at an elevation of 8,900 ft. in Wyoming.

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WITH a bucket capacity of ¾ cu. yd., this Unit 1020 Dragline is designed for jobs where power, speed, stability and long reach are vital. To help keep it on the go with minimum maintenance, it uses Timken® tapered roller bearings at vital points: 2 on the vertical idler gear, 2 on the vertical swing shaft, 8 on the conical rollers, 4 on the fairlead.

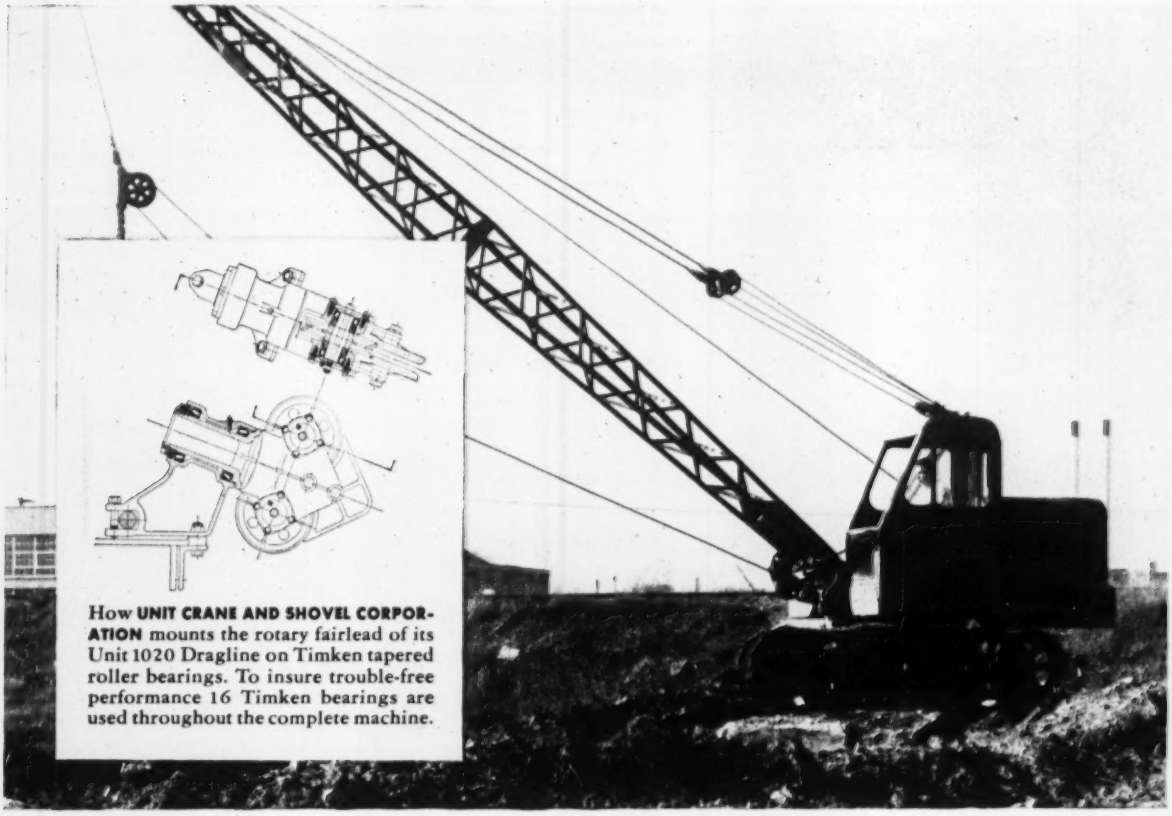
Timken bearings take radial and thrust loads in any combination. Line contact between their rollers and races gives them extra load-carrying capacity. Shafts and gears stay in alignment, reducing wear. The true rolling motion and incredibly smooth finish of Timken bearings practically eliminate friction.

Because they keep housings and shafts concentric, Timken bearings make closures more effective. Dirt, dust stay out—lubricant stays in. Lubrication costs and time are reduced.

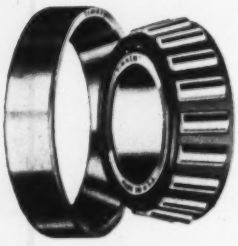
Timken bearings normally last the life of the machine. They are 1) engineered for the job, 2) made of Timken fine alloy steel, 3) precision manufactured.

Why not profit from the more than 50 years of bearing research and development of the Timken Company? Specify Timken bearings in the machinery you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

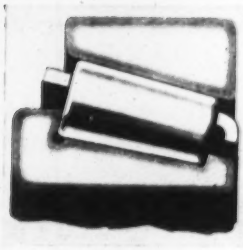


How **UNIT CRANE AND SHOVEL CORPORATION** mounts the rotary fairlead of its Unit 1020 Dragline on Timken tapered roller bearings. To insure trouble-free performance 16 Timken bearings are used throughout the complete machine.



TIMKEN

TAPERED ROLLER BEARINGS



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION